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- S7049 - Extended Services for OS2 Communication Manager - Student - Lab Notebook

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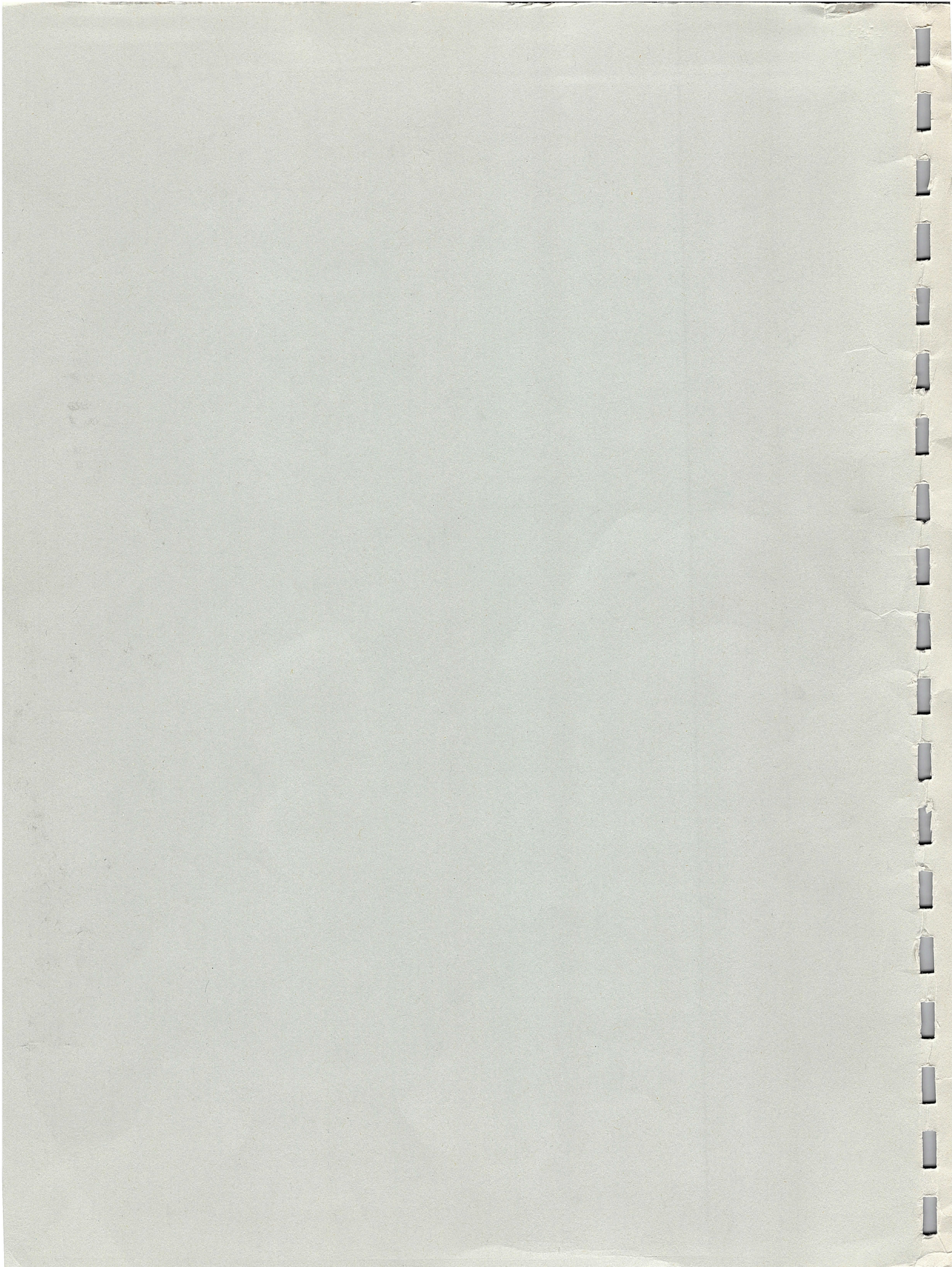
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IBM OS/2 VERSION 2.1  
INSTALLING and SUPPORTING  
COURSE CODE P1071  
STUDENT NOTEBOOK

EDUCATION

SDC









Installing and  
Supporting OS/2 2.1  
(Course Code P1071)

**Student Notebook**  
ERC1

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# Course Description

## Purpose

This course teaches you how to install, customize, and support the OS/2\* 2.1 operating system. You will learn how to plan OS/2 installation, addressing issues such as hard disk management, memory management, and application support. You will also learn how to customize system control files and application settings, and how to install and support printers. This course uses hands-on practice sessions and case studies.

## Audience

This course is intended primarily for people such as help desk personnel or technical workgroup leaders who will be supporting other users. Activities performed include installing code and answering questions on using OS/2. This course is also appropriate for OS/2 users who do not have access to other support personnel and who need to be self-supporting.

## Objectives

After completing this course, you should be able to:

- Given a customer requirement, plan an OS/2 installation, recommending the appropriate hardware configuration and installation methods.
- Install OS/2, customizing system files to meet customer needs.
- Configure and customize application settings.
- Answer questions about the installation and operation of OS/2 2.1.

## Prerequisites

Before taking this course, you should have a working knowledge of DOS and the OS/2 Workplace Shell\*. You should be able to:

- Use basic DOS commands.
- Describe and modify system files such as CONFIG.SYS.
- Manipulate the FAT file system.
- Describe the purposes of DOS memory extenders.
- Use and operate the OS/2 Workplace Shell.

Workplace Shell skills are taught in "Using and Customizing OS/2 2.1" (P1070).



# **Agenda**

- Day 1**      **Unit 1 OS/2 - A Review**  
                 **Unit 2 Basic Installation**  
                 **Unit 3 Hard Disk Management**
- Day 2**      **Unit 4 Alternative Installations**  
                 **Unit 5 Installing and Configuring Printers**  
                 **Unit 6 Fonts**  
                 **Unit 7 OS/2 Control Files**
- Day 3**      **Unit 8 Application Support**  
                 **Unit 9 Support**  
                 **Unit 10 Advanced Installation Topics**  
                 **Testing Your Skills**



# Unit 1. OS/2 - A Review

## What This Unit is About:

In this unit typical customer problems and concerns about installing and supporting OS/2 will be identified. From both a user and system perspective, key product features will also be identified.

## What You Should Be Able To Do

After completing this unit, you should be able to:

- From a user perspective, identify key features of OS/2.
- Identify key features of OS/2 from a system perspective.
- Have confidence in your ability to apply pre-requisite Workplace Shell skills.

## How You Will Check Your Progress

- Checkpoint

## References

- *OS/2 2.1 Technical Update*, GG24-3948

## Review Exercise 1.1

### What This Exercise Is About

Workplace Shell skills are prerequisites for this course. This brief review will provide practice on four basic Workplace Shell skills:

- Use direct manipulation.
- Display and use object pop-up menus.
- Display and use object settings notebooks.
- Access and use online help.

### What You Should Be Able To Do

At the end of this exercise you should feel confident that you have the required pre-requisite skills.

Notify your instructor if you have difficulty with the tasks in this exercise.

## Exercise Instructions

Use your basic Workplace Shell skills to answer the following questions. If you need help, you may refer to the exercise instructions in Appendix B.

1. The OS2SYS.INI file is located in the C:\OS2\INSTALL directory.
2. The README object is located in the Information folder.
3. Which of the following actions is not available for the OS/2 System folder?  
Delete, Create shadow, Move, Copy
4. What are the available views of the OS/2 System folder? ICON, TREE, DETAILS  
(right mouse button, settings)
5. Which objects on your Desktop are shadows? DOS Window, OS/2 Window,  
all drives, WIN-OS/2 full screen.
6. Jim calls the Help desk. He doesn't want to see a message box to confirm deletion of objects when dragged to the Shredder. What should he do?  
OS/2 System / System Setup / System - change settings to  
click off "confirm on delete"
7. Helen uses the OS/2 command interface frequently. What can she do to make access to the command prompt convenient? ~~make a link~~  
Create shadow of OS/2 window or full screen on desktop
8. Mary has moved the MYPROG.EXE file to the desktop and her program will not run correctly. What should she do to fix the problem? \_\_\_\_\_  
Review program settings, Create program reference.
9. John wants to double-click a data file created by an old DOS application and have the file loaded into the application automatically. What should he do?  
"Association" in program reference file.

## Installing and Supporting OS/2

**What do you think are the major customer issues when installing OS/2?**

- Lack of information included with basic product.

- Complementary <sup>product</sup> installs

- Managing Flexibility

- Required hardware

- Training

- Printers

**What are your major concerns when supporting OS/2 workstations?**

- Customization of individual workstations - Standardization of WPS

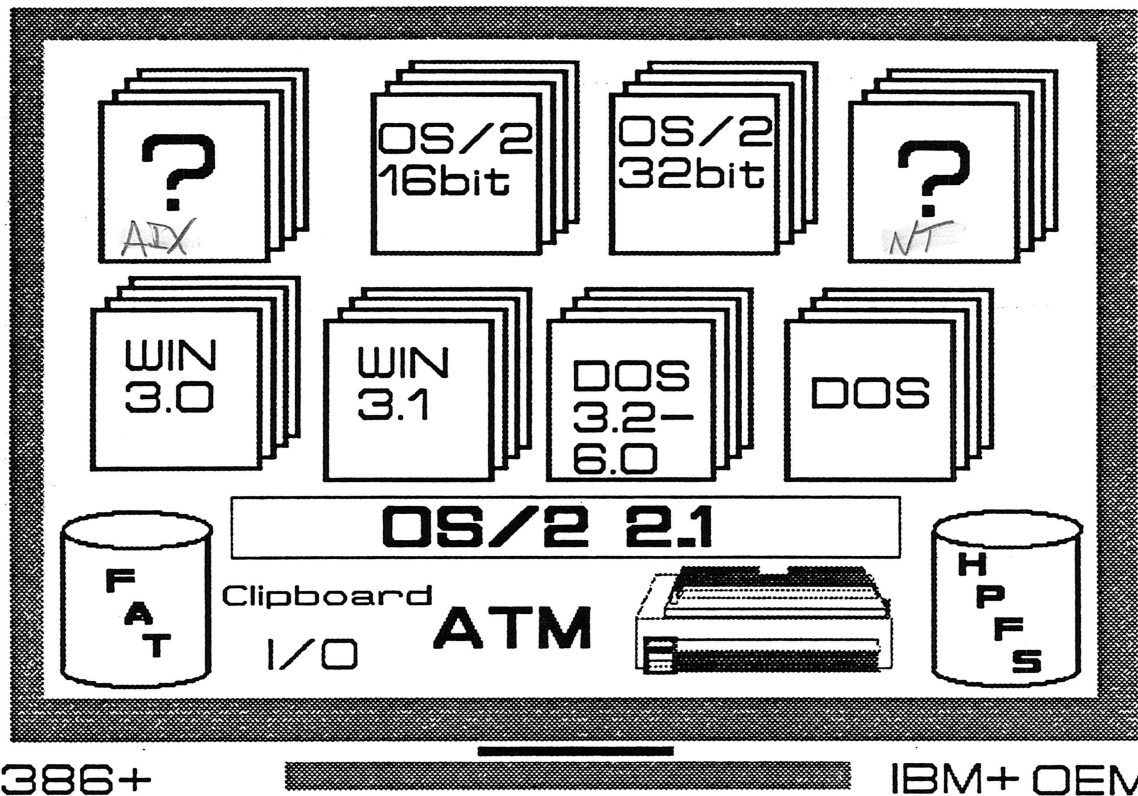
- Backup

- Installation

- Booting from Floppy



## Integration Platform – User Perspective

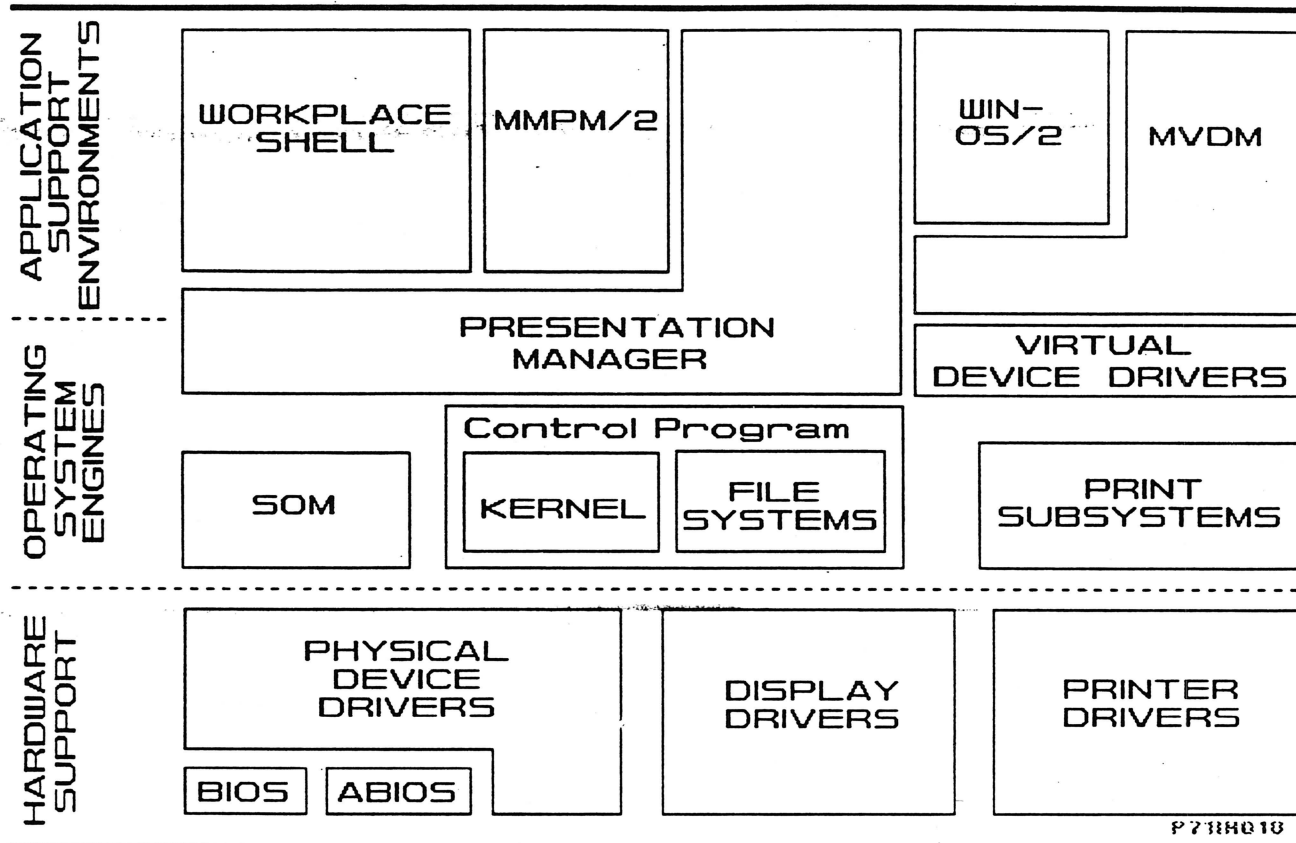


### Notes:

How OS/2 addresses some common concerns:

- Preemptive multitasking
- Memory management
- Compatibility
  - DOS applications
  - Windows\*\* applications
  - OS/2 applications
- Migration
  - Flat memory model
  - APIs
- Productivity
  - Workplace Shell
  - Protect mode 386+
- OS/2 controls
- I/O (Input/Output) to devices
- File system choices for performance and data integrity
  - FAT (File Allocation Table)
  - HPFS (High Performance File System)
- ATM\*\* (Adobe Type Manager 2.5) included
  - For OS/2
  - For Windows applications
- Runs on IBM and other (OEM) Intel 80386\*\* and follow-on processors

## OS/2 2.1 – System Perspective



### Notes:

**Workplace Shell** - Desktop user interface, command prompts, workplace objects, utilities

**MMPM/2** - Multimedia Presentation Manager/2\* applications

**Presentation Manager\*** - Presentation Manager (PM) applications

These applications are written to PM APIs (Application Program Interfaces)

**WIN-OS/2\* 3.1** - Windows application support

**MVDM** - (Multiple Virtual DOS Machines) - DOS application support

**Virtual Device Drivers (VDDs)** - allow VDM sharing of devices; interfaces to OS/2 device drivers

**SOM** - (System Object Module) object handlers, class libraries

**Kernel** - Processes, memory, interprocess communications (IPC)

**File systems** - FAT, HPFS, CDFS (CD-ROM File System)

**Print Subsystem** - Spooling

**Physical Device Drivers** - Basic device drivers (keyboard, mouse, ...), disk device drivers (SCSI and non-SCSI), SCSI peripheral device drivers (CD-ROM, ...)

**Display Drivers** - Base video handlers, PM display drivers, WIN-OS/2 display drivers

**Printer Drivers** - PM printer drivers, WIN-OS/2 printer drivers

For the most part, OS/2 manages physical resources (printers, memory, disk, adapters, etc.). This provides the ability for many programs to **share** all the resources without most of the problems encountered in the DOS environment.

## Unit 2. Basic Installation

### What This Unit is About:

OS/2 can be installed to address many particular user needs. This unit teaches how to perform basic installation when OS/2 is the only operating system needed. You will install OS/2 2.1 on a primary partition, using panel install.

### What You Should Be Able To Do

After completing this unit, you should be able to:

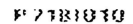
- Identify key issues of installation.
- List the minimum hardware requirements for PS/2\* and OEM systems environments.
- Discuss the available media used for installation (diskette, CD-ROM, LAN).
- Describe the steps performed to install OS/2 2.1.
- Plan a basic installation to meet a given customer requirement.
- Describe and take advantage of the granularity of installation.
- Perform basic installation of OS/2.
- Add features to an installed system.

### How You Will Check Your Progress

- Checkpoints
- Apply skills in exercises

### References

- *OS/2 2.1 Installation Guide*
- *OS/2 2.1 Installation and Planning Guide*



- What types of applications do you want to run?
- Is the system used for system testing or critical applications?
- Do you want to keep or replace the operating system on your system?
- Are there issues about training?
- Is the hard disk divided into partitions? What is on the hard disk? Free disk space?
- Does your system have the minimum hardware needed to support the application?

## Decision Points – Applications

Applications	OS/2			Other	
	Base	DOS Emulation	WIN-OS/2	8086 Sys.	?
OS/2 16-bit	X				
OS/2 32-bit	X				
DOS	X	X			
Windows	X	X	X		
=====	=====	=====	=====		
Other 8086				X <sub>(1)</sub>	
Native				X <sub>(2)</sub>	X <sub>(3)</sub>
-----	-----	-----	-----	-----	-----

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### Notes:

Will OS/2 support the application portfolio? Many applications can be configured to run under OS/2. In addition, an 8086 operating system, such as DOS or CPDOS, can be booted under OS/2 to provide support for applications which will not run directly under OS/2 DOS emulation.

(1) An example of an application that can only run using a DOS kernel under OS/2 is LANTastic\*\* 4.1.

(2) An example of an application which requires native DOS boot is Norton Utilities\*\* 5.0. Some of its utilities that manipulate the hard disk, such as UNDELETE, can cause an OS/2 system halt.

(3) An application not supported by OS/2 or DOS that may require another operating system such as AIX\*.

Chapter 26 of *Using the Operating System* has detailed information about many applications.

## Decision Points – Hard Disk

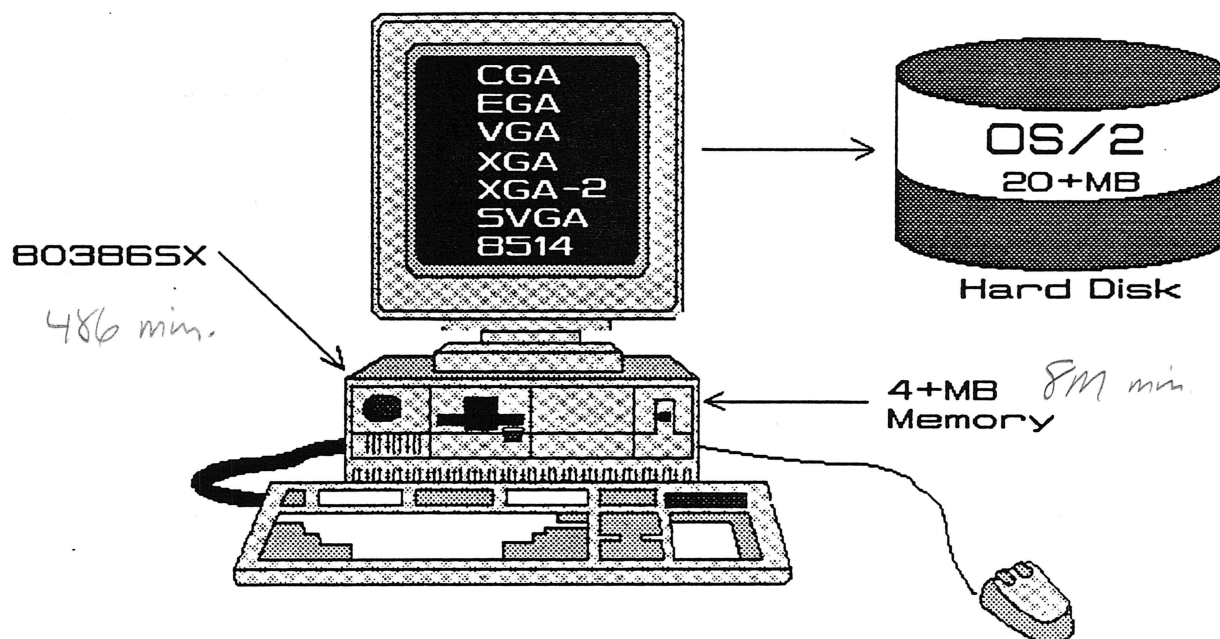
Action	Hard Disk Contents		
	Empty	DOS [Windows]	OS/2 [1.x,2.0]
Replace	partition	-available space -migration	-available space -migration
=====	=====	=====	=====
Preserve	partition	-available space -migration -how?	-available space -migration -how?

P7181015

### Notes:

Even though applications may run using just OS/2, the configuration and contents of the hard disk will influence your installation plan. For example, in some circumstances, you may have to backup and restore applications and/or existing operating system components in order to achieve the desired result.

## Decision Points – Hardware



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### Notes:

All 80386SX\*\* and above IBM computers with the necessary configuration can support OS/2 2.1. For information on currently supported non-IBM hardware, see Appendix A, *Information and Planning Guide*, or:

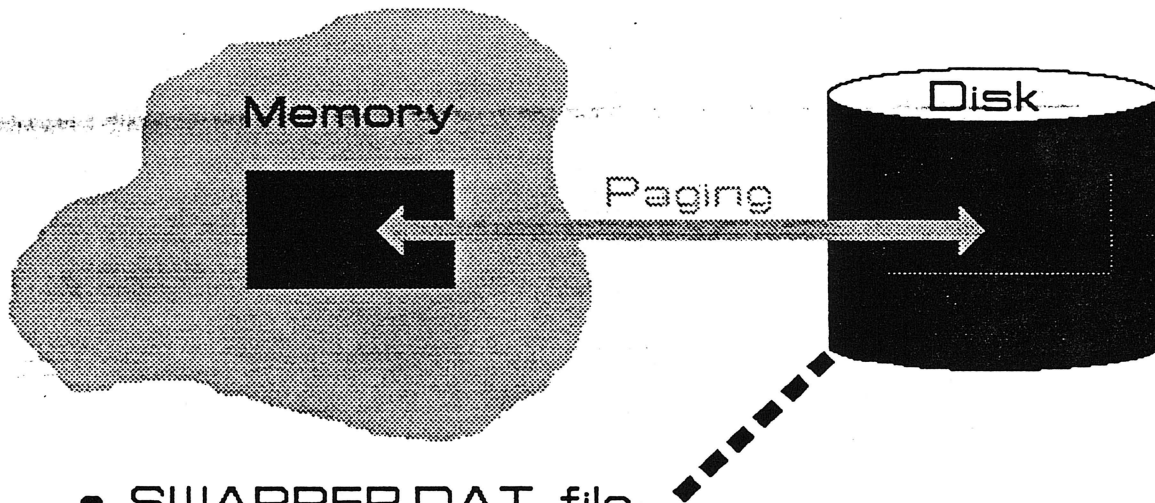
- Prodigy\*\*. For membership information call (914)962-0310.
- CompuServe\*\*. For membership information call (800)848-8199.  
For members--IBM OS/2 Support Forum \Library\IBM Files\PCMTABLE.
- IBM Personal Computer Company Bulletin Board System (919)517-0001.  
Modem speeds 1200 to 9600 supported. Set modem for 8 data bits, 1 stop bit, no parity.

32-bit device drivers are available for all graphics displays shown above except CGA and EGA. The new SVGA display device drivers supplied with OS/2 support the most popular chipsets in the industry. Other SVGA drivers are obtained from approved board manufacturers. The OS/2 README file in the Information folder contains information about specific devices.

Keyboard strokes are available for a majority of Workplace Shell functions. But a mouse is highly recommended for most productive use of the graphical user interface.

XGA\*

# Memory



- SWAPPER.DAT file
- Allocated based on physical memory
- Location specified during installation

P7181062

## Notes:

To implement memory addressing of up to 4 gigabytes on a system with only megabytes of real memory, OS/2 utilizes a memory management approach called paging. Memory pages are only paged out to the disk swap file when total memory demands on the system exceed the available real memory. These pages will be returned to real memory when needed. The sophisticated memory management of OS/2 frees the end user of most concerns about memory requirements of programs, as well as the concern about running multiple programs concurrently.

The minimum memory requirement for OS/2 2.1 is 4MB. The "memory" available is the sum of the real physical memory plus the hard disk space available to the swap file on the hard disk.

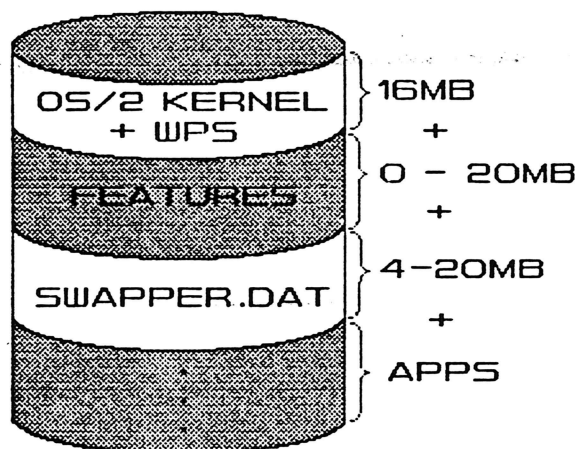
In general, the less memory you have, the more disk space must be allocated for the swap file. Swap file size is determined at installation time by the system, depending on the amount of physical memory installed.

<u>Memory</u>	<u>Swap file default</u>
4MB	6MB
6MB	5MB
8MB	4MB
9-10MB	3MB
11-16MB	2MB

The system will dynamically try to shrink the file to the original allocation; this increases overhead. You may want to accept the default at installation, run the system, and then decide what the system load really requires.



## Disk Space Requirements



- Selective Installation of features

- SWAP file size (paging)
  - Amount of real memory
  - System load

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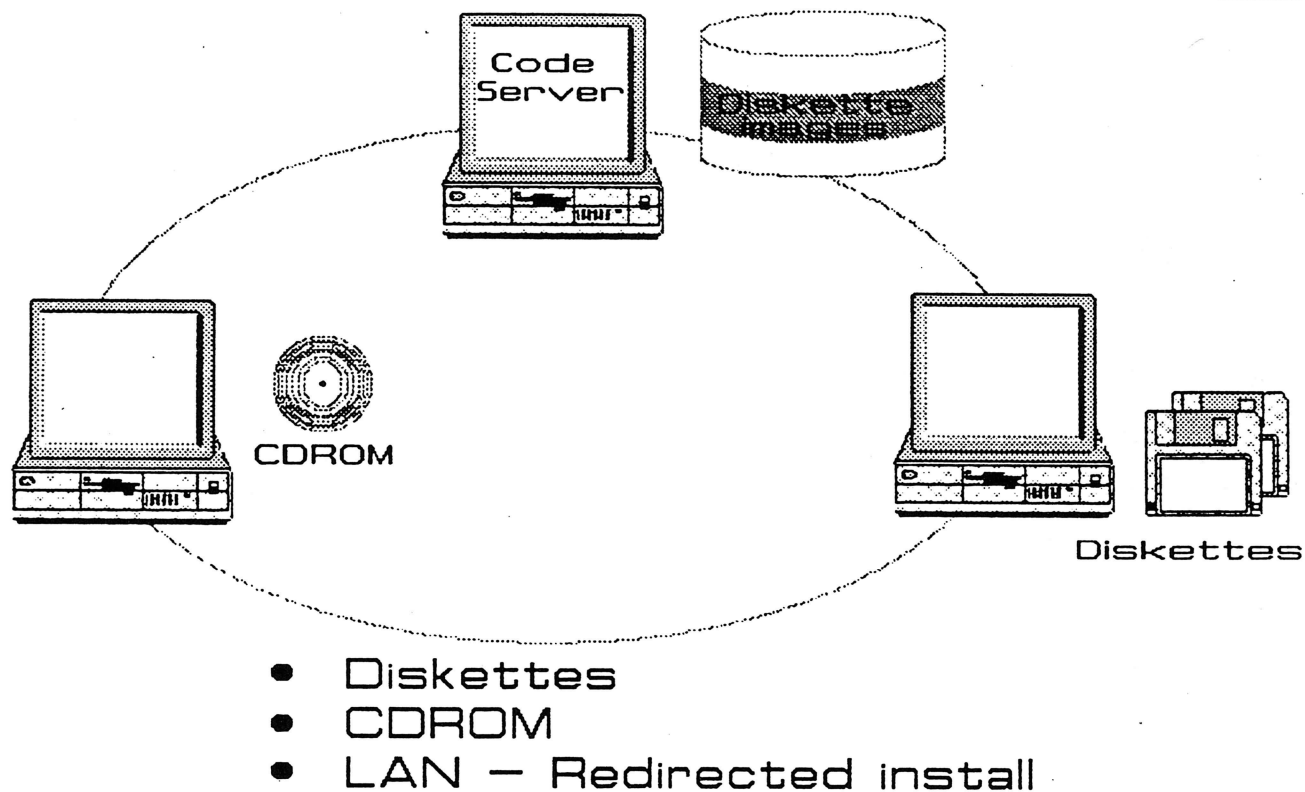
### Notes:

Hard disk and memory estimating worksheets are available in the *OS/2 2.1 Information and Planning Guide*, but here are some key components to consider:

Operating System	16 - 36MB
File Systems -Fat 64KB/partition	---
-HPFS + 5%/partition size	---
Swap file	4MB+
Printer drivers (250KB-1MB)	---
Extra spool space if needed (1-5MB)	---
Total	~20 - 40MB free space

\* WIN/OS2 } can be on separate ~~the~~ location.  
 Swapper  
 Spoolfile

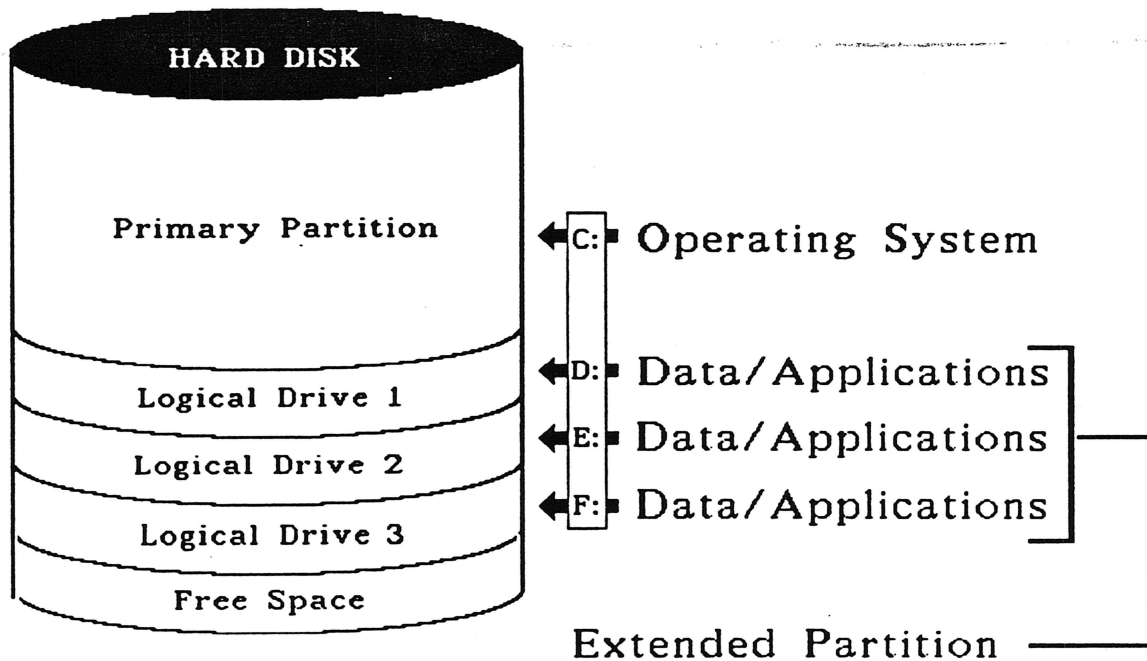
## Media



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### Notes:

## Basic Installation Partitions



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### Notes:

#### Definitions:

**Volume** - Physical hard disk

**Partition** - A fixed size area on a volume, composed of one or more logical drives. Used to store operating systems and data.

**Primary partition** - Consists of only one logical drive, usually referred to with the letter 'C'. Typically used for operating systems, e.g. DOS and OS/2 1.x must be installed on a primary partition.

**Extended partition** - Can be subdivided into multiple logical drives, usually referred to using D, E, ... Z. Typically used for programs and data.

**Drive** - A logical subdivision of a partition.

**Free space** - Space on the disk not assigned to any partition.

Both a primary partition and each logical drive can be managed as a unit, including performing format, backup, and restore operations.

If you are installing OS/2 as the only operating system on your machine, you will generally put OS/2 in a primary partition and create an extended partition with logical drives for applications and data. You should have multiple partitions and multiple drives as appropriate to your customer's needs. This approach eases maintenance and use.

# FDISK

FDISK				
Disk 0				
Partition Information	Status	Access	FS Type	MBytes
	Startable	C: Primary	FAT	38
	None	D: Logical	FAT	28
	None	: Pri/Log	FreeSpace	31

F1=Help      F3=Exit      Enter=Options Menu

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## Notes:

FDISK is accessed during Phase 1 of installation when you do NOT accept the pre-defined drive for installation. It is also available on diskette #1 for use at a command prompt for emergency use. The FDISK window displays the following information about your partitions and logical drives:

**FS Type** - The file system type of the partition if already formatted.

**MBytes** - The size of the partition or free space.

Commonly used options on the FDISK Options Menu include:

**Create partition** - Creates primary partitions or logical drives on the hard disk. Partitions and logical drives can be created at the start or end of the free disk space. To modify an existing partition, it must be deleted and recreated.

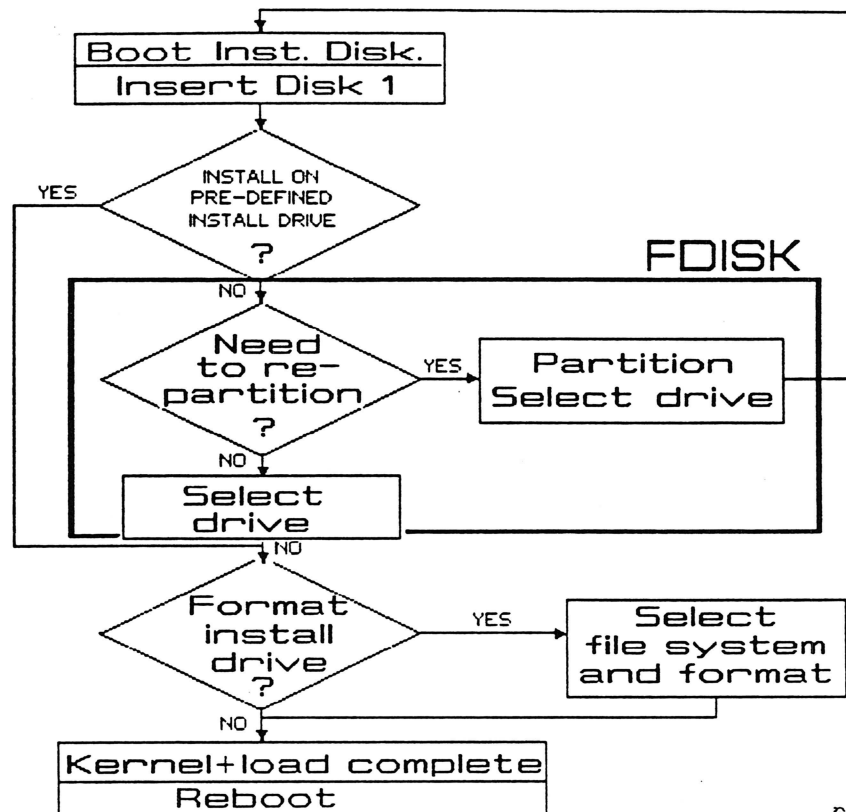
**Delete Partition** - Deletes primary partitions or logical drives from the hard disk.

**Set Installable** - Sets the selected partition as the target for OS/2 installation.

Other column titles and options are discussed in Unit 4.

# Installation Steps

Phase 1.  
Install  
Kernel +  
Graphic  
Install



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## Notes:

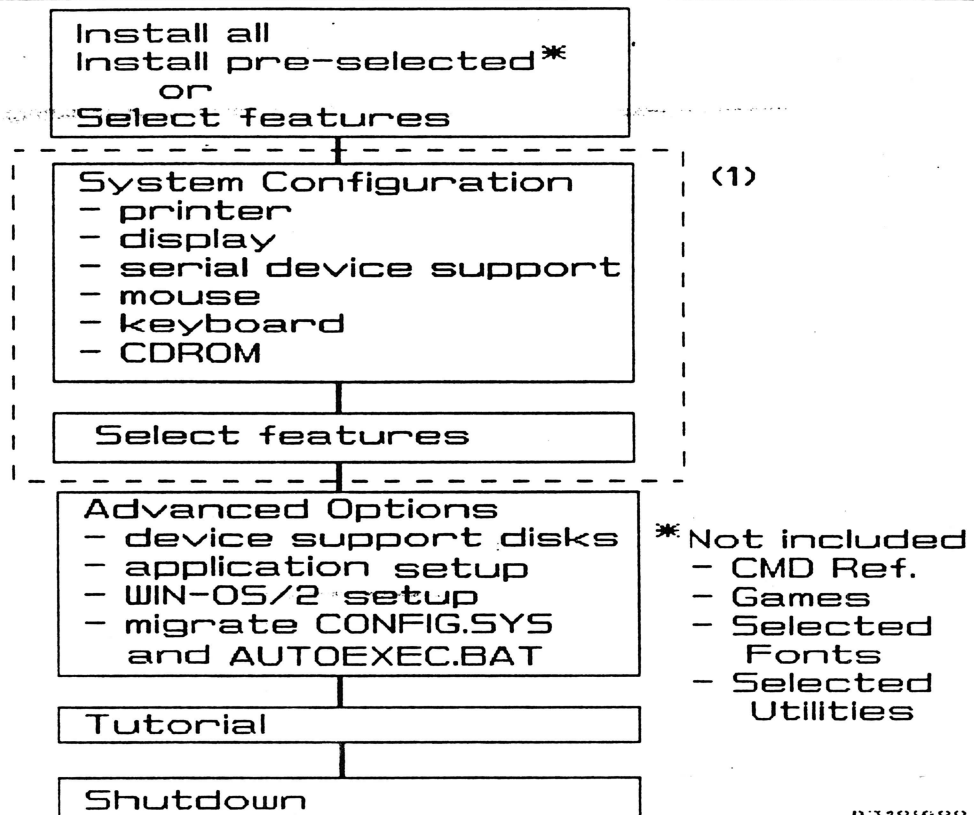
The README file contains important information including known problems and suggested corrective actions. It is a good idea to browse this file, contained on Diskette #3, in \*.INS format, used with the OS/2 System Editor or another ASCII editor, before proceeding with installation.

If you do not accept the default target install drive, you will use FDISK to select the installation drive and/or re-partition the disk. If you re-partition, you will need to restart the installation by inserting the Installation diskette and rebooting.

When the loading of the kernel and the Presentation Manager graphic installation program completes, you will be instructed to reboot. This will start the graphical interface used for Phase 2 of the installation.

## Installation Steps – Continued

### Phase 2. Install Other Features



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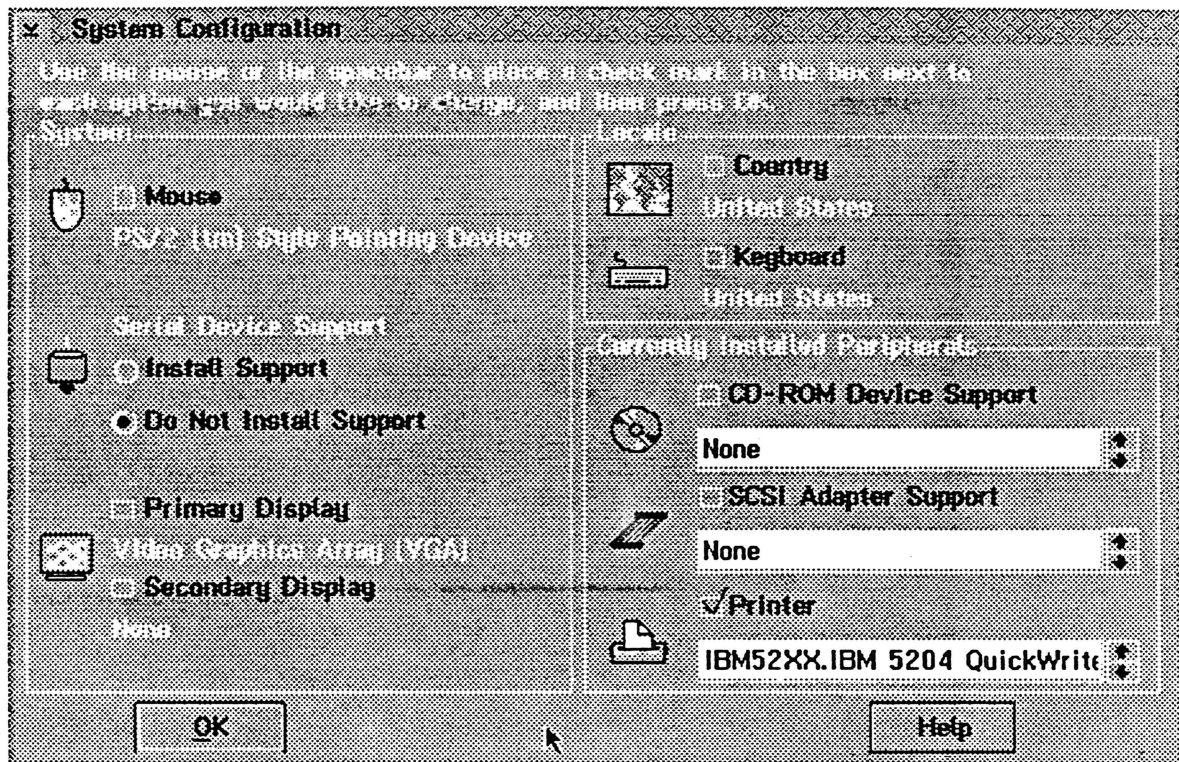
### Notes:

The total disk requirement to install all features, including a 4MB swap file, is 40MB. About 32MB total is required to install the pre-selected choices. The Select Features option will range between 20 and 40MB total, depending on your selections.

The Tutorial will be available while the system is completing the installation.

- (1) These functions may be accessed post installation to install additional devices or features. Refer to pages 2-13 and 2-14.

# System Configuration



P71B1092

## Notes:

OS/2 will sense many devices attached to the system and display them on this screen. Because the installation program detects the type of devices attached to your system, most of these choices should be correct.

In particular, if you have a mouse attached to your system and the mouse is working (you can move the mouse pointer, for example), do **NOT** change the mouse selection.

*Limited to one printer at install time*



## Selecting Features

**OS/2 Setup and Installation**  
Options Software configuration Help

Make sure there is a check in the box next to the features you wish to install. Select "More..." to make additional choices for a feature.

<input checked="" type="checkbox"/> Documentation (0.8MB) .....	More...
<input checked="" type="checkbox"/> Fonts (1.9MB) .....	More...
<input type="checkbox"/> Optional System Utilities (1.6MB) .....	More...
<input type="checkbox"/> Tools and Games (6.0MB) .....	More...
<input checked="" type="checkbox"/> OS/2 DOS Support (1.3MB) .....	More...
<input checked="" type="checkbox"/> WIN-OS/2 Support (9.0MB) .....	More...
<input type="checkbox"/> High Performance File System (0.4MB)	
<input type="checkbox"/> Advanced Power Management (0.1MB)	
<input type="checkbox"/> PCMCIA Support (0.1MB)	
<input type="checkbox"/> REXX (0.4MB)	
<input type="checkbox"/> Serviceability and Diagnostic Aids (0.7MB)	
<input type="checkbox"/> Optional Bit Maps (0.1MB)	

**Install**

Available (bytes)  
8771584

Needed (bytes)  
4157857

P71B1100

### Notes:

This screen allows other important function in addition to selecting features you wish to install. Use the selections on the action bar to:

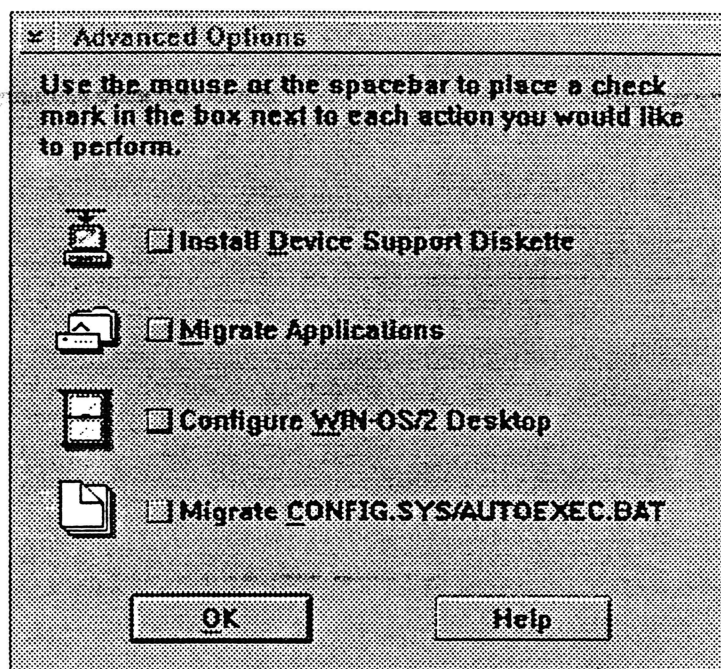
- format drives configured in Phase 1 using FDISK (Options).
- modify CONFIG.SYS parameters, including the location of the swap file (Software configuration).

Use **More...** as appropriate to further refine install selections. Note that pressing More... on the WIN-OS/2 Support selection allows you to select a drive for installation of the WIN-OS/2 support. (F1 can be used at any time to learn more about each option.)

If you plan to install the swap file or WIN-OS/2 support on a drive other than the OS/2 install drive, be sure to format the target drive.



## Advanced Install Options



P71B1110

### Notes:

This screen allows you to perform advanced system configuration during installation.

Select **Install Device Support Diskette** if you are adding peripherals (other than printers or plotters) that come with device drivers on separate device support diskettes.

**Migrate Applications** searches the online OS/2 application database and migrates DOS, Windows, or OS/2 applications that are already stored on your hard disk. You can also use this option to migrate applications not found in the database.

Select **Configure WIN-OS/2 Desktop** if you want to customize the appearance of the desktop in WIN-OS/2 sessions. You may wish to do this if you already have Windows installed and you want the new desktop to look like the old one.

Select **Migrate CONFIG.SYS/AUTOEXEC.BAT** if you are loading OS/2 over another operating system. This option will take statements from your existing CONFIG.SYS and AUTOEXEC.BAT files and migrate them to the new OS/2 files.

## Checkpoint

1. If you do not have enough free space on the install drive to install all the OS/2 function you need, what components can be installed on other drives?

SWAP file, WIN/OS2, Spool file

2. Your new machine has a 300MB disk. Would you partition the drive with at least a C: and D: drive? Yes If so, why? Separate operating system from

the application

3. Which reference is a good source of information about applications on OS/2?

Using OS/2 in install box & README

4. How is the minimum OS/2 configuration installed?

Don't check off any boxes on the Features menu.

5. Upon what two factors does the amount of space needed for the swap file depend?

main memory, hard disk space

## Exercise 2.1 OS/2 System Planning

### What This Exercise is About

Congratulations! You've just been made System Administrator for Xerxes Data Systems (XDS)! Your primary duty is to install and support 1,000 new PS/2s, which are to be installed with OS/2. Your first assignment is to install OS/2 on the first of these machines and learn about the basic installation process.

### What You Should Be Able To Do

At the end of this exercise you should be able to:

- Analyze a customer requirement and develop an installation plan.
- Select which components of OS/2 are to be installed and determine their storage requirements.
- Plan a layout of the hard disk that considers variables such as a customer's need for spool space, growth of the swap file, adding printers, and other requirements.

### Problem Statement

#### Applications

Twenty newly-hired secretaries will have machines previously belonging to other employees. The new users will run DOS, Windows and OS/2 applications. These applications will require **15MB** of hard disk space. All applications will run properly under OS/2.

#### Hard Disk

Although the machines have DOS and applications already installed, XDS system programmers have decided that all information on the systems will be deleted and that the following partitions are to be used for the hard disk:

<u>Drive</u>	<u>Usage</u>	<u>Size</u>	<u>File Format</u>
C:	OS/2	30MB	FAT
D:	applications/data and other	35MB	FAT
E:	unused	remaining	unformatted

Experience with this type of user indicates they will have multiple documents open concurrently. Allow **10MB** for the swap file. They will need **2MB** of spool space for printing. In addition, you must allow **5MB** of space on the C drive for future growth.

**Hardware**

The Intel based 80386 machines have:

Disk	160MB
Memory	8MB
Display	VGA
Mouse	PS/2
Keyboard	USA
Serial devices	yes
Printer	--- Printers have not been purchased yet, but you should plan for three specific printer drivers to be installed later. For now, install the default printer IBMNULL.

**OS/2 Features**

Users will need only the operating system and the optional features as indicated in Table 1 below. You must determine how much space the features will take on the C and D drives.

**Table 1 : Disk Space Requirements for OS/2 Base and Optional Features**

	Space Needed(KB)	Space Used	
		C	D
Base	16000	16000	
Optional Features:			
Documentation			
- OS/2 Tutorial	177		
- OS/2 Command Reference	427 *(604)	604	
Fonts (All)	1902	1902	
Utilities			
- Change file attributes	37		
- Display the directory tree	34		
- Manage partitions	228		
- Recover files	47		
- Sort filter	32		
- Installation Utilities	501 (879)	879	
Tools and Games			
- Enhanced Editor	926		
- Search and Scan Tool	71 (997)	997	
OS/2 DOS Support (ALL)	1300	1300	
WIN-OS/2 Support (ALL)	9000	?	9000
REXX	400 (400)	400	
Total Optional Features	15082KB	6082KB?	9000?
Total Base and Optional Features	31082KB	22082KB	9000KB

\* Total for all features in the category.

Complete the table below and decide how to install. When complete, show your plan to your instructor before continuing to Exercise 2.2, OS/2 System Installation. Use the questions on the next page as needed to help you analyze the customer requirements.

Table 2: Hard Disk Planning Worksheet			
Component	Required Disk Space	User Configuration	Install Drive
Operating system base	16.0MB	16.0MB	C
Optional features on C:		? 6m	C
Optional features on D:		? 9m	D
Printer Device Drivers	100-500KB each	? .5m	C
Print Spool File Space	1MB - 5 MB	? 2mB	C
Swap File	Minimum 2MB	? 10mB	? D
Room for growth		5MB	C
Applications		? 15mB	D
Total			

Total space used on Drive C 29.5 mB  
 Total space used on Drive D 34 mB

Maximum available 30  
 Maximum available 35

## Key decisions to be made when completing your installation plan:

1. Will all applications run on OS/2 or do you need more than one operating system?

No

2. Will you keep or replace the existing operating system? Replace

3. Will the hardware support OS/2? YES but barely. Advise upgrade?

4. Based on the physical memory, how much space will the system allocate for the swap file by default? 4MB

Be sure your plan includes disk space for the growth of the swap file.

5. What is the total amount of disk space needed to meet your customer requirement, including the swap file? Use Table 2 to determine the space.

63.5 MB

6. The customer says the C: drive can only be 30MB. Will the C: drive be big enough for the functions required and the planned space needed for the swap file?  
Yes \_\_\_\_\_ No ✓

If not, what will you do?

- Move swap file to another drive? move to D:
- Install WIN-OS/2 on another drive? move to D:

## Exercise 2.2 OS/2 System Installation

### What This Exercise is About

Using the plan created in the previous exercise, install OS/2 to meet the user requirements.

### What You Should Be Able to Do

At the end of this exercise, you should be able to:

- Use FDISK to partition a hard disk to meet a given user requirement.
  - Create a primary and an extended partition.
  - Format partitions during installation.
  - Install selected features of OS/2 during a panel install.
  - Install a default printer.
- Change parameters in the CONFIG.SYS file during installation.

## Exercise Instructions

You are ready to proceed with the installation of the OS/2 operating system. Before the actual system files are installed, you will partition the hard disk.

### Partition the hard disk.

- \_\_\_ 1. Place the **Installation Diskette** in the A: drive and reboot the system
- \_\_\_ 2. Follow the instructions on the screen as directed. When the **Installation Drive Selection** screen is displayed, select option 2, **Specify a different drive or partition**. The Modifying Partitions Warning screen is displayed.
- \_\_\_ 3. Press the **Enter** key to continue with the modification.
- \_\_\_ 4. Delete all partitions and drives on the disk.
  - Using the up and down arrow keys, place the selection bar on the entry to be deleted and press the **Enter** key.
  - Select **Delete partition**.
  - Repeat the above 3 steps until all drives are removed.
- \_\_\_ 5. Create the OS/2 primary partition, 30MB.
  - Press the **Enter** key to display the Options menu.
  - Select **Create partition...** from the Options menu. The Size of partition window is displayed.
  - Type **30** as the size of the primary partition and press **Enter**.
  - Select **Primary Partition**. The Location of Partition window is displayed. Select **Create at Start of FreeSpace**.
- \_\_\_ 6. Create the D: and E: logical drives.
  - Using the arrow keys, place the selection bar on the **FreeSpace** entry and press the **Enter** key.
  - Select **Create partition...** from the Options menu. The Size of partition window is displayed.



- Enter **35** for the size of the first logical drive, D: and press the **Enter** key.
- Select **Extended Logical Drive**.
- Select **Create at Start of FreeSpace**.
- Repeat the above steps and create logical drive E:, using the remaining free space.

\_\_\_\_7. Set the C: primary drive as **installable**.

- Place the selection bar on the C: drive and press **Enter**.
- Select **Set installable....**
- Enter the name **OS/2** in the New Name menu and press the **Enter** key.

\_\_\_\_8. Save and exit FDISK.

- Press the **F3** key to stop the FDISK utility. The Exit FDISK window is displayed.
- Press **F3** again to save the modified partition configuration.

\_\_\_\_9. Place the Installation Diskette in Drive A: and press **Enter** to restart the system.

**Checkpoint:** Why do you think you must restart the system?

So system recognizes what disk the install is going to take place in. Disk must also be formatted

### Install The OS/2 Kernel and graphical install program (Phase 1).

- \_\_\_\_1. When the Installation Drive Selection screen is displayed, select **Option 1, Accept the drive**.
- \_\_\_\_2. On the Select the File System screen, select **FAT file system**.
- \_\_\_\_3. Select the mouse.

- \_\_\_\_ 4. Continue the installation by following directions on the screen and by answering the prompts.

**Note:** If you are using a LAN install, the system will complete phase one of the installation by accessing disks 1 through 5 from the X: drive.

- \_\_\_\_ 5. When prompted, remove diskette 1 and press **Enter**.

**IMPORTANT: DO NOT reboot.** At this point, there is a small OS/2 system built on the hard drive. When you remove the diskette and press Enter, the system will reboot itself to continue the install process.

**Checkpoint:** When this phase of the installation completes, what is on your hard disk?

A small OS/2 system

**Install required features. (Phase 2).** Refer to Table 1 in Exercise 2.1 to determine which system features are to be installed. Refer to Table 2 to determine where features are to be installed. Be sure to format the D drive if your plan requires function to be installed on the D drive.

- \_\_\_\_ 1. On the OS/2 Setup and Installation screen, choose **Select features and Install** and press **OK**.

- \_\_\_\_ 2. On the System Configuration screen, verify that serial device support and default printer boxes are checked.

No other choices should be necessary. The system has sensed the keyboard and mouse and defaulted to **US** for keyboard and country.

Press **OK** to display printer choices.

- \_\_\_\_ 3. **Page Down** and select **IBMNULL**, then press **OK**. The system will return to the System Configuration screen. Press **OK** to continue to the next screen.

- \_\_\_\_ 4. The OS/2 Setup and Installation screen allows you to:
- format drives.
  - modify CONFIG.SYS.
  - select features to be installed.
  - monitors the space required for the selected features.

**Checkpoint:** Do you need to format any drives? Yes \_\_\_\_\_ No \_\_\_\_\_  
If yes, which drive? \_\_\_\_\_ File system? \_\_\_\_\_

\_\_\_\_ 5. If necessary, format the D: drive FAT.

- Select Options on the action bar.
- Select **Format**.
- Select **D** and the appropriate file system type. Press **Format**. Wait until the format completes before continuing. You can make selections, but you cannot do anything with the D drive until the format is completed because the system checks to see if it is a valid drive.

**Checkpoint:** Do you need to move the swap file from the default location?

Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, where will you put it? \_\_\_\_\_

\_\_\_\_ 6. If you need to install SWAPPER.DAT on another drive, change OS/2 CONFIG.SYS parameter **SWAPPATH** to D:\.

- Select **Software Configuration** option on the action bar.
- Select **Change OS/2 parameters....**
- Change **SWAPPATH** to D:\ and press **OK**.

\_\_\_\_ 7. Deselect the features your customer does not need. Use Table 1 on page 2-18 to determine needed features. Be sure to use the menus accessed by pressing **More...** in the options.

**Checkpoint:** Do you need to install WIN-OS/2 on another drive? Yes \_\_\_\_\_ No \_\_\_\_\_

If yes, where? \_\_\_\_\_

\_\_\_\_ 8. If you need to install WIN-OS/2 on another drive, use the **More...** option.

**Checkpoint:** Do you have enough space to install the selected configuration?

Yes \_\_\_\_\_ No \_\_\_\_\_

Tip: The "needed" value includes a pad of about 2-3MB.

\_\_\_\_ 9. When satisfied with the configuration, select **Install**. If you get a warning that there is not enough space and your 'needed' is not more than 2-3MB more than 'available', proceed with the installation.

- \_\_\_ 10. When the **Advanced Options** screen appears, deselect all options; press **OK**.
- \_\_\_ 11. Follow directions and press **Enter** to reboot the system when prompted.
- When system installation is complete, you will be prompted to press the **Enter** key to reboot the system.
  - When the OS/2 Tutorial appears after reboot, you will know that the system has been successfully installed. Remember, it may take several minutes for the desktop to appear; the OS2.INI and OS2SYS.INI files are being built.
- \_\_\_ 12. You may wish to put shadows or copies of some frequently-used objects on your desktop. For example, the **OS/2 Window command prompt**, the **WIN-OS/2 command prompt**, **Drive C** and **Drive D** will be frequently used in later exercises.
- \_\_\_ 13. Open the **Information** folder and open the **README** file. Browse this for future reference.
- \_\_\_ 14. Open the Settings notebook of **Drive C**. Check the **Details** page.
- How much space did your configuration take? \_\_\_\_\_
- \_\_\_ 15. How much space is used on the Drive D? \_\_\_\_\_
- \_\_\_ 16. If your class is using a LAN install, install network support on your system so you can use a redirected drive instead of diskettes for future exercises.
- Insert the **NTS/2 Diskette** in the A drive. At an **A:** prompt, type **NTS2**.
  - When the message "ThinIFS completed successfully" appears, perform a **shutdown**. When you reboot your system, you will access the LAN.

---

## Adding Devices

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- Selective Install
- DSPINSTL command
- Device Driver Install

P7181160

---

### Notes:

Use Selective Install for:

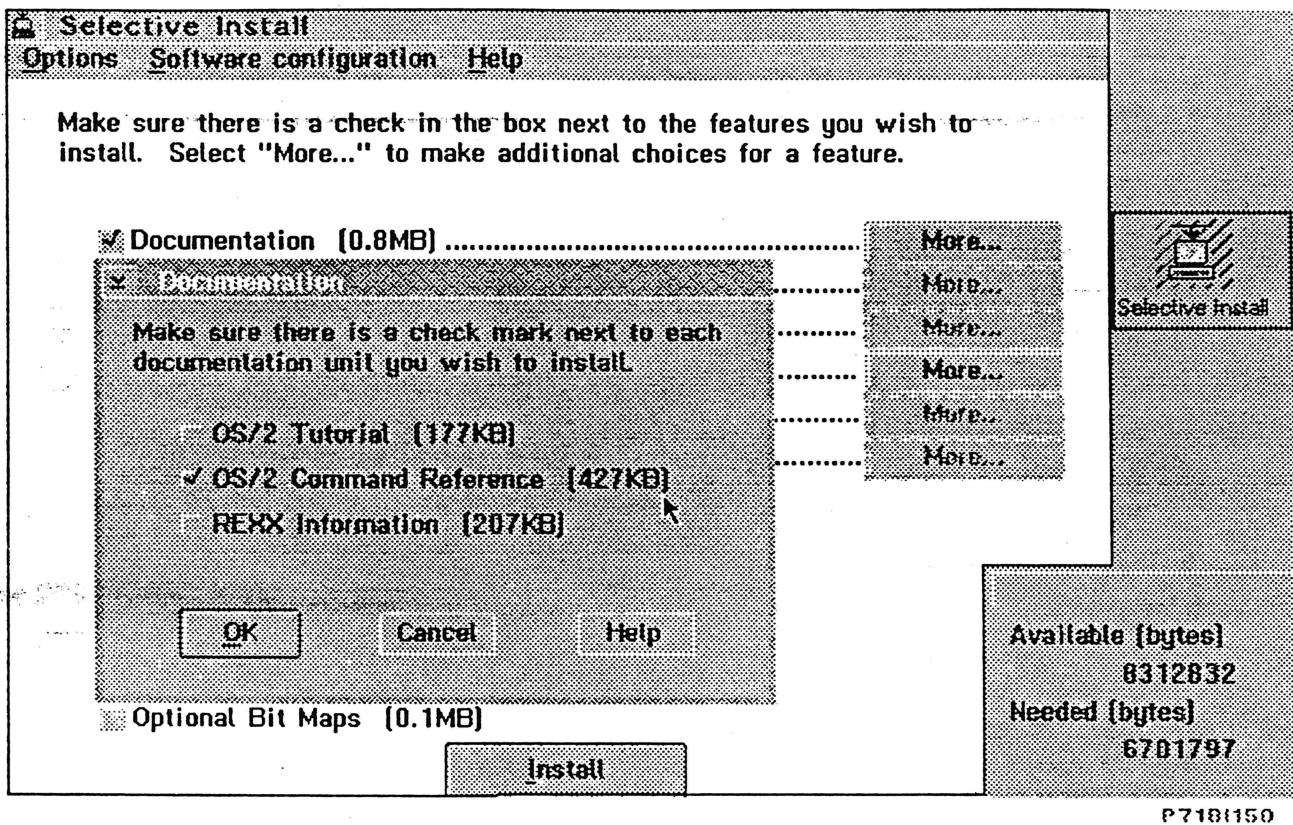
- Mouse
- Serial device (COM ports)
- SCSI adapter and device drivers
- CD-ROM
- Updating display drivers

The installation program detects the type of display adapter and device attached to your system. For example, Video Graphics Array (VGA) will be displayed if you have a VGA adapter. If your system has a Super VGA (SVGA) device, the installation program will install basic support for the device. However, if you want to install full support for your device (so that it supports higher resolutions, for example), you will need to add this support after installation. To add the support after installation, use the DSPINSTL command.

Use Device Driver Install, located in the System Setup folder for:

- Drivers not provided with OS/2
- Drivers provided on diskette with a disk driver or SCSI adapter

## Post Installation – Adding Features



### Notes:

Detailed instructions for adding features and devices are in the *OS/2 2.1 Installation Guide*, Appendix A - Adding Features and Changing Your System Configuration.

*OS/2 2.1 Using the Operating System*, Part 5, Extra Help, Chapters 27-29, contains detailed information and tips on hardware support, including video, printers, CD ROM, etc.

## Exercise 2.3 Adding Features

### What This Exercise is About

The *Selective Install* utility allows you to place additional drivers, applications, and documentation onto your hard drive after the initial installation is complete.

### What You Should Be Able to Do

At the end of this exercise you should be able to:

- Use the Selective Install utility to install OS/2 features which were not originally placed in your system at initial installation.

### Problem Statement

After consulting with IBM, the training manager of Xerxes Data Systems has decided that adding a game to the OS/2 system would be an excellent training tool. The tools in the Personal Productivity feature are also needed. In addition, HPFS support will be needed.

The following features are to be installed.

<u>Application</u>	<u>Space Required (KB)</u>
Personal Productivity	1407
Scramble	62
Pulse	53
HPFS	400
Total	<u>1922KB</u>

These features will be installed on the OS/2 drive. Do you have enough room for this growth?

## Exercise Instructions

- \_\_\_\_ 1. Start the **Selective Install** utility.
  - Display the **desktop** pop-up menu and select **System Setup**. Start the **Selective Install** utility.
  - The **System Configuration** window is displayed. This is the same window you saw during the initial system install. Here you may modify the mouse driver, keyboard and country settings for the installed system, or change the primary or add a secondary video card driver.
  - Press the **OK** pushbutton to continue with the installation procedure. The options for application and documentation installation are displayed.
- \_\_\_\_ 2. Select **Personal Productivity, Scramble** and **Pulse**.
  - Check the checkbox to the left of **Tools and Games**.

Note the window at the lower right of the desktop, the **Disk Space** window. It indicates the amount of disk space available on the current partition, as well as the amount of space required to install the selected option(s).

How much disk space does installing **all** tools and games require?

---
  - Press the **More...** pushbutton to the right of the **Tools and Games** option. The Tools and Games window is displayed.
  - Deselect the checkboxes to the left of the applications that are **not** to be installed and press the **OK** pushbutton.

How much space does installing the three selections require?

---
- \_\_\_\_ 3. Select **HPFS Support**.
- \_\_\_\_ 4. **Install** the selections and HPFS support.
  - Press the **Install** pushbutton to proceed with the installation.
  - If you are installing over the LAN, verify the directory entry points to the **X:** drive, and press **Install....**



- A message box is displayed after the features have been installed. Press the **OK** pushbutton.

\_\_\_\_ 5. Perform an orderly system shutdown.

- Note that you must restart the system in order for the changes to take effect.

When you boot for the next exercise, HPFS support will be available and program icons for the newly-installed applications will be in the Productivity folder.



## Unit 3. Hard Disk Management

### What This Unit is About:

OS/2 provides significant flexibility in utilizing the hard disk.

Two file systems are provided, each with advantages depending primarily on the size of the partition.

### What You Should Be Able To Do

After completing this unit, you should be able to:

- Describe disk layouts supported by OS/2.
- Given a customer environment, develop a plan for disk layout.
- Use FDISK to create multiple primary partitions.
- Describe the purpose of Boot Manager.
- Install, configure, and use the Boot Manager.
- Describe the file system support provided with OS/2.
- Describe extended attributes.
- Describe issues of OS/2 coexistence with native DOS on the hard disk.
- Compare the file systems and recommend when each is to be used.

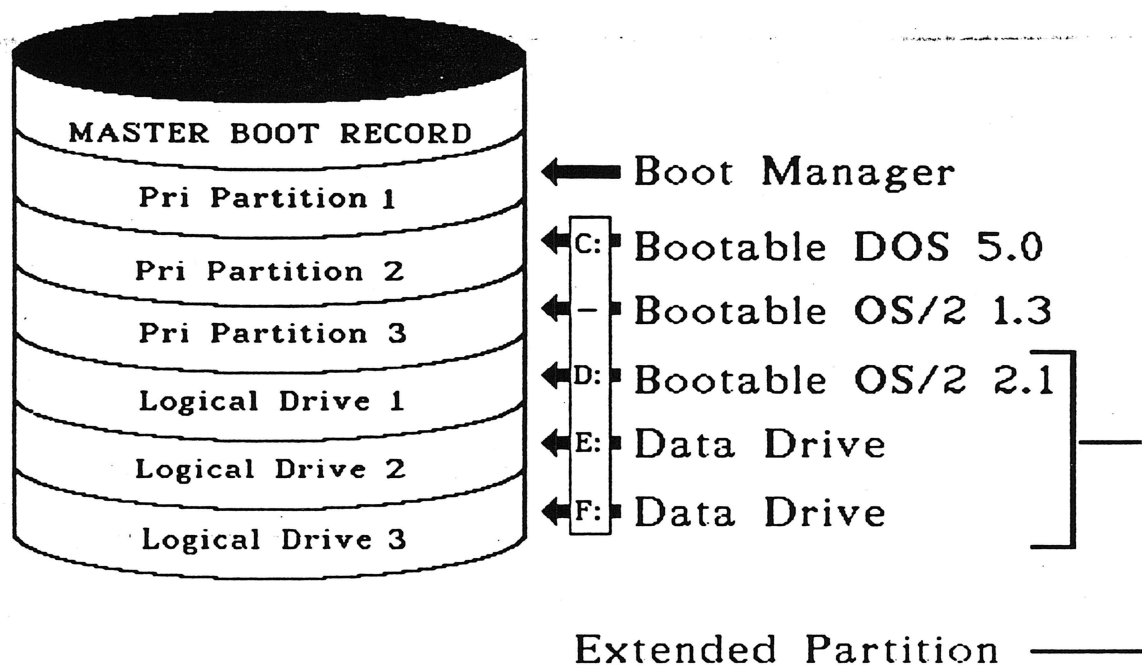
### How You Will Check Your Progress

- Apply skills in exercises
- Checkpoint

### References

- OS/2 2.1 Installation Guide, Chapter 4
- OS/2 2.0 Volume 1: Control Program (52G9938)

## OS/2 Disk Partitions



P71HD050

### Notes:

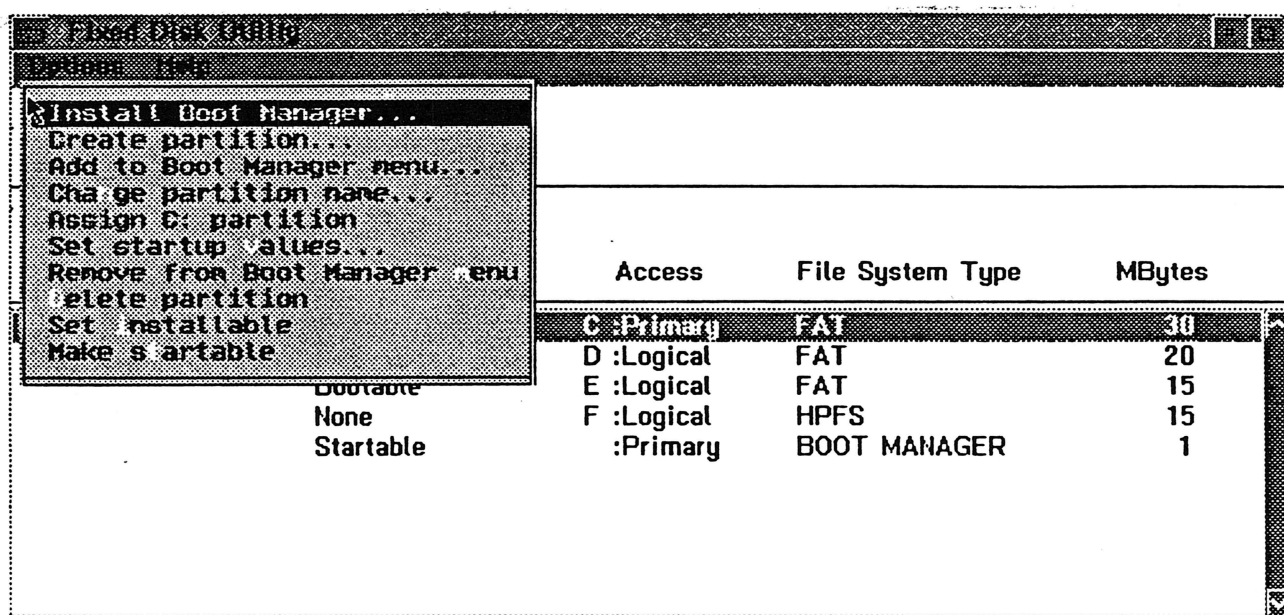
The master boot record contains the current disk configuration and information on how to read the disk.

Each hard disk can be divided into a maximum of four partitions. One partition may be an extended partition, which can be further divided into logical drives, e.g. D:, E:, etc. A primary partition must be used to store DOS or OS/2 1.x operating systems. Logical drives can be used to store programs and data. OS/2 2.x can also be installed on a logical drive. Note that only one C: partition can be seen. The primary partition "2" above is invisible.

The Boot Manager allows you to start any operating system installed on the hard disk. The Boot Manager counts as one of the partitions and takes 1MB of disk space. It may be installed either at OS/2 installation time or added after installation.

While it is not mandatory, it is good practice to keep operating systems, applications, and data on separate partitions or logical drives. This makes it possible to upgrade operating systems or applications with minimal risk to data. If data files are on their own logical drive, it is also easy to back up just that drive to save your data.

# FDISK – The Boot Manager



F21HD070

## Notes:

Here are the enhanced features of FDISK used to support multiple primary partitions and the Boot Manager.

**Name** - Name assigned to logical drives that is displayed on the Boot Manager menu.

**Status** - Indicates if a drive is installable, bootable, startable, or none of the above.

**Access** - Specifies how a drive is accessed.

Installable: OS/2 will be installed in this drive.

Bootable: The drive contains an operating system and can be booted using the Boot Manager.

Startable: The drive will be booted directly when the system starts.

**Install Boot Manager** - Creates a Boot Manager partition and loads the Boot Manager.

**Add to Boot Manager Menu...** - Makes the new partition bootable, selectable from Boot Manager Menu.

**Change Partition Name...** - Changes the name of a partition in Boot Manager menu.

**Set Startup Values...** - Specifies startup values such as a default partition, startup menu timeout, or mode for the Boot Manager menu.

**Set Installable** - This partition is ready to receive a new operating system.

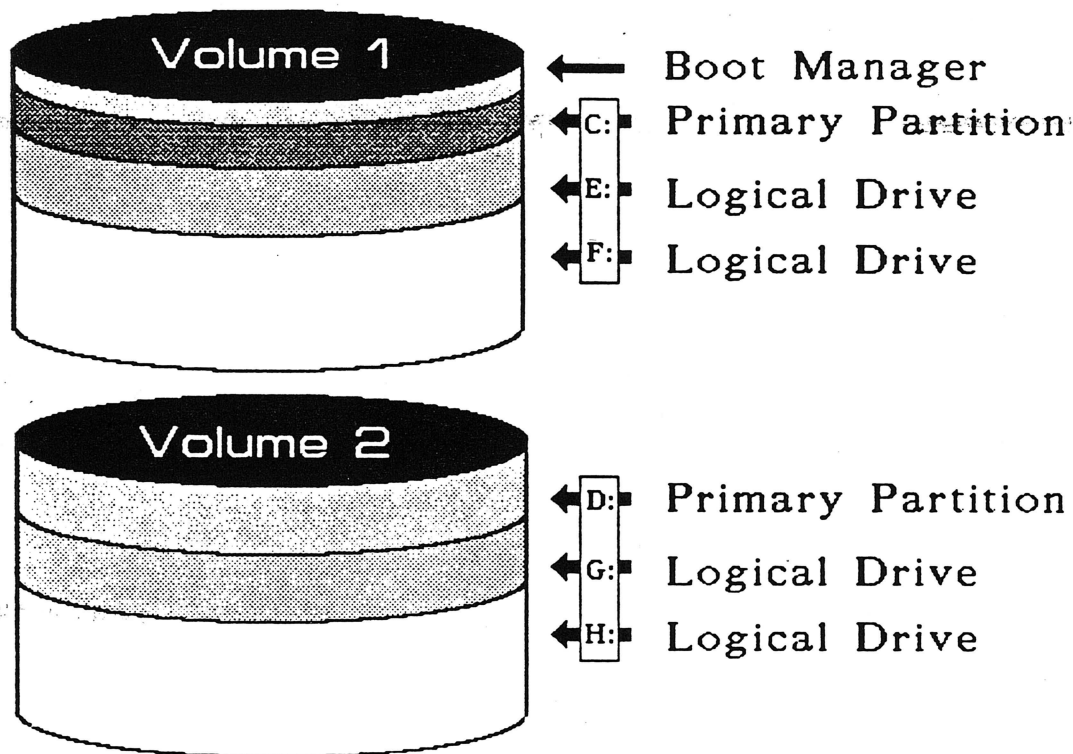
**Make Startable** - Use this choice to set a Primary partition as the direct restart target.

For Boot Manager to be active, the Boot Manager partition must be set to Startable.

**Assign C: partition** - Specifies the accessibility of primary partitions if there are more than one. Only one primary partition per hard disk can be active; other primaries are hidden.



## Multiple Volumes



P71HD060

### Notes:

Primary partitions will be lettered consecutively, even if they are on separate physical disks.

There are two programs provided to manage the hard disk(s):

- FDISK.COM is used during installation. It can also be accessed from the command line.
- FDISKPM.EXE is a Presentation Manager application, invoked from the Drives pop-up menu or the command line. It is installed by selecting the Manage Partitions option.

## Exercise 3.1 Case Study: Disk Layouts

### Objectives

Apply your knowledge of FDISK to meet a customer need. **Note:** More than one disk layout will meet the requirements below.

### Current Environment

Your customer's machine has 120MB of actual space and is configured with two drives.

C: Primary 60MB

D: Logical 60MB

No backup of these drives is required.

### Required

1. Your customer wants three bootable operating system drives of at least 25MB each.
2. Your customer wants two logical drives of equal size. These logical drives will use the remaining free space for data and applications.

Steps to be performed:

1. Boot manager at end of drive
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

Your solution: Drive Layout

Name	Status	Access	MBytes
BOOT1	Bootable	C: Primary	25
BOOT2	Bootable	: Primary	25
BOOT3	Bootable	D: Logical	25
	NONE	E: LOGICAL	22
	NONE	F: LOGICAL	22

## Exercise 3.2 Case Study: Multiple Volumes

### Objectives

Apply your knowledge of FDISK to meet a customer need. **Note:** More than one disk layout will meet the requirements below.

### Current Environment

Your customer's machine has a disk configured as follows:

C: Primary 160MB

No free space

The customer has already backed up data on the hard disk.

### Required

Your customer is adding a second 160MB volume and wants two bootable operating systems: one on Volume 1 and the second on Volume 2. Allow 50MB of space for each operating system.

Both Volume 1 and 2 need two logical drives each for data; allow a minimum of 54MB for each drive.

Steps to be performed on Volume 1:

---

---

---

---

Steps to be performed on Volume 2:

---

---

---

---

Solution: What is the resulting configuration?

Volume 1:

Access	Size

Volume 2:

Access	Size

Do you have an alternative solution?

Volume 1:

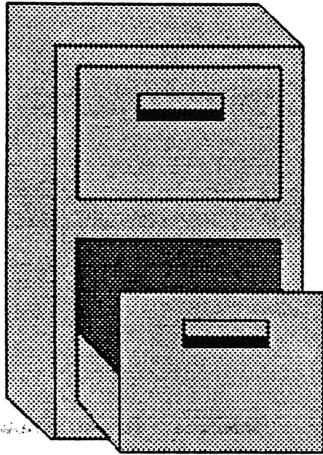
Access	Size
C:	50
D:	54
E:	55

Volume 2:

Access	Size
FREESPACE	in
F:	

## Disk File Systems

---



- FAT File System
- High Performance File System (HPFS)

---

P72FS010

### Notes:

OS/2 provides two disk file systems:

- The File Allocation Table (FAT) system: originally used with DOS and diskettes.
- The High Performance File System (HPFS): designed for OS/2 and use of large drives and large files; supports long file names of up to 254 characters.

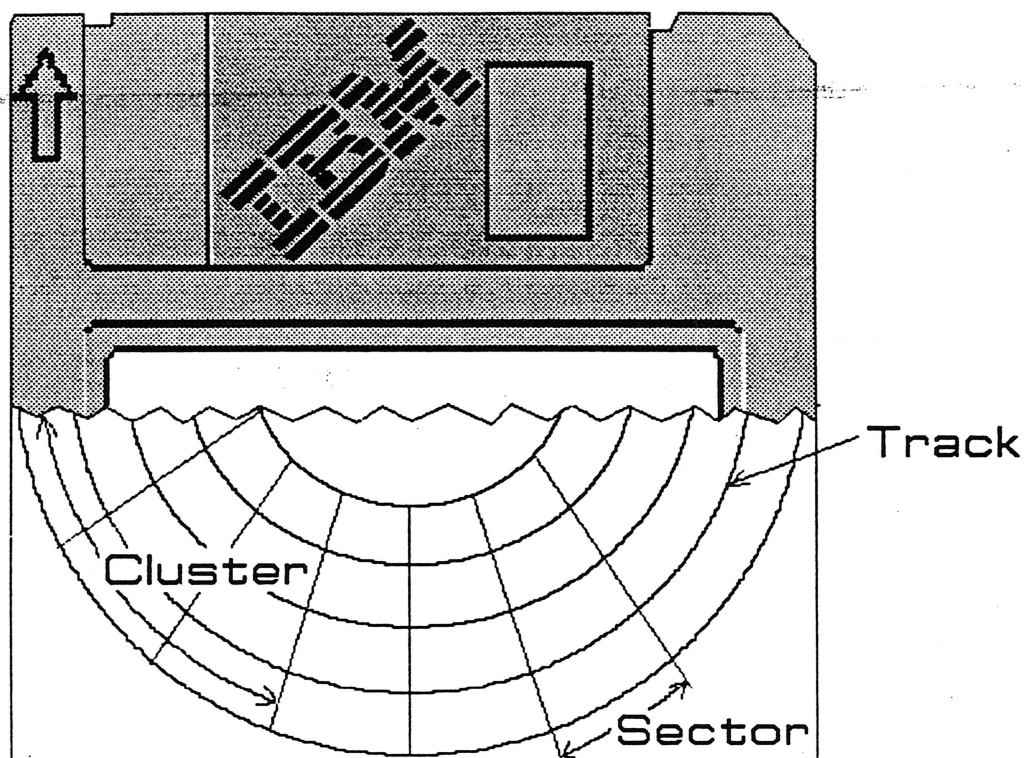
With OS/2 2.0, the FAT system was enhanced to provide many features included with HPFS.

Either file system can be specified during the OS/2 installation process. Both file systems can coexist on the same physical disk if the disk is set up with more than one partition or drive. Each drive can be formatted for the file system desired.

Applications running under OS/2 may access data stored using either file system.



## Disk Structure – FAT



F72FS040

### Notes:

The structure of a disk is similar to that of a diskette. Visualize your new unused hard drive as initially blank.

The Format command divides the disk/drive into concentric **tracks** and then further divides each track into units called **sectors**. Files are stored on your disk by recording the information on the sectors.

Files are stored on the drive in groups called **clusters** or **allocation units**. (An allocation unit defines the smallest amount of disk space that can be allocated for a file.) Depending on the file size, the file may fit into a single cluster or may require many clusters. Attempts are made to store a file's clusters in consecutive disk locations. However, if this is not possible, the file will become fragmented. Each cluster will contain multiple disk sectors.

To keep track of each file's cluster(s), a table, called the **File Allocation Table**, is created on the drive. This table contains every cluster available on the drive and indicates, for each cluster, whether

- it is in use,
- it is available, or
- it has been marked as unusable.

## File Allocation Table

Cluster	Next Cluster
2	3
3	4
4	FFF8
5	.
6	.
7	.
8	.
9	.
.	.

**TABLE A**

File A, in table A, is in clusters 2, 3, 4, "Unfragmented"

Cluster	Next Cluster
5	9
.	.
.	.
9	15
.	.
.	.
15	FFF8
.	.
.	.

**TABLE B**

File B, in table B, is in clusters 5, 9, 15 "fragmented"

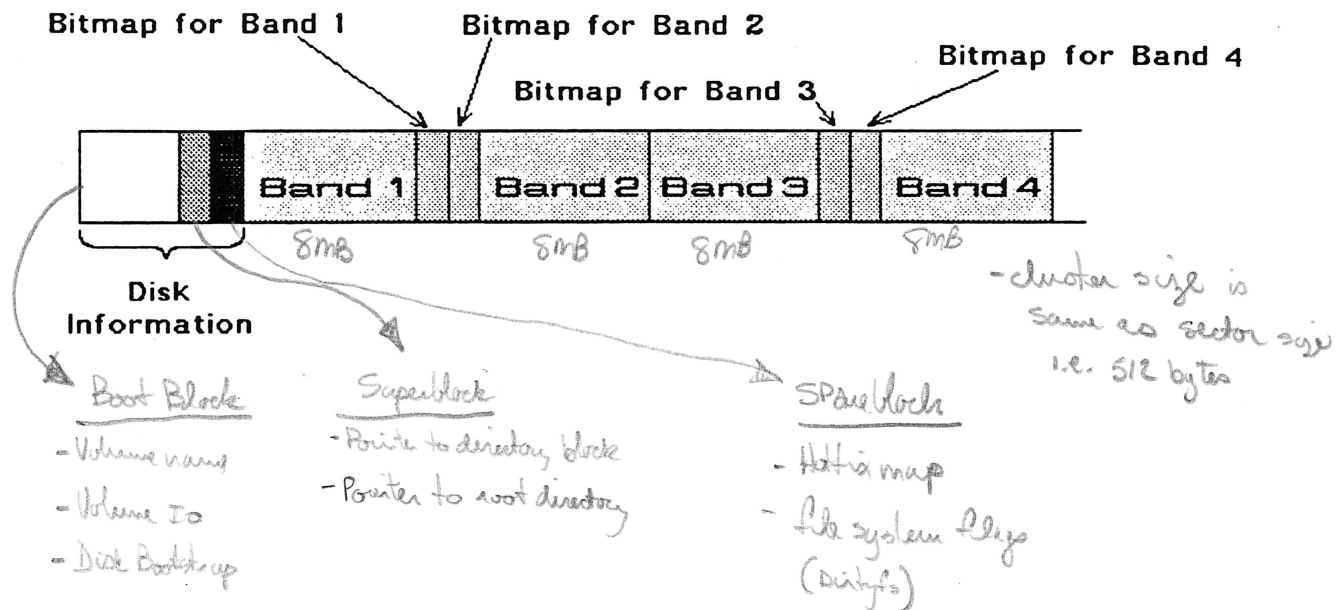
P72FS050

### Notes:

The File Allocation Table is used to locate each file's clusters on disk, storing the list of cluster numbers that make up each file. When a file is required, the system follows the file's cluster chain to determine where the file is situated. The starting cluster of a file is indicated by the file's directory entry.

A directory contains a list of file names and information for each file in that directory. For every file you create on a FAT file system drive, the FAT file system creates a directory entry that contains 32 bytes of information. The starting cluster of a file is one of the items listed for each file. The FAT file system stores directories on the drive in one or more clusters, just as if they were files. Every time you need to access a file, the FAT file system must first locate the directory that file is situated in. To read that directory, it must be brought into memory. Once in memory, it can then be determined if the required file is in that directory.

# HPFS Structure



P72FS080

## Notes:

The disk information area contains information about the drive and flags and pointers.

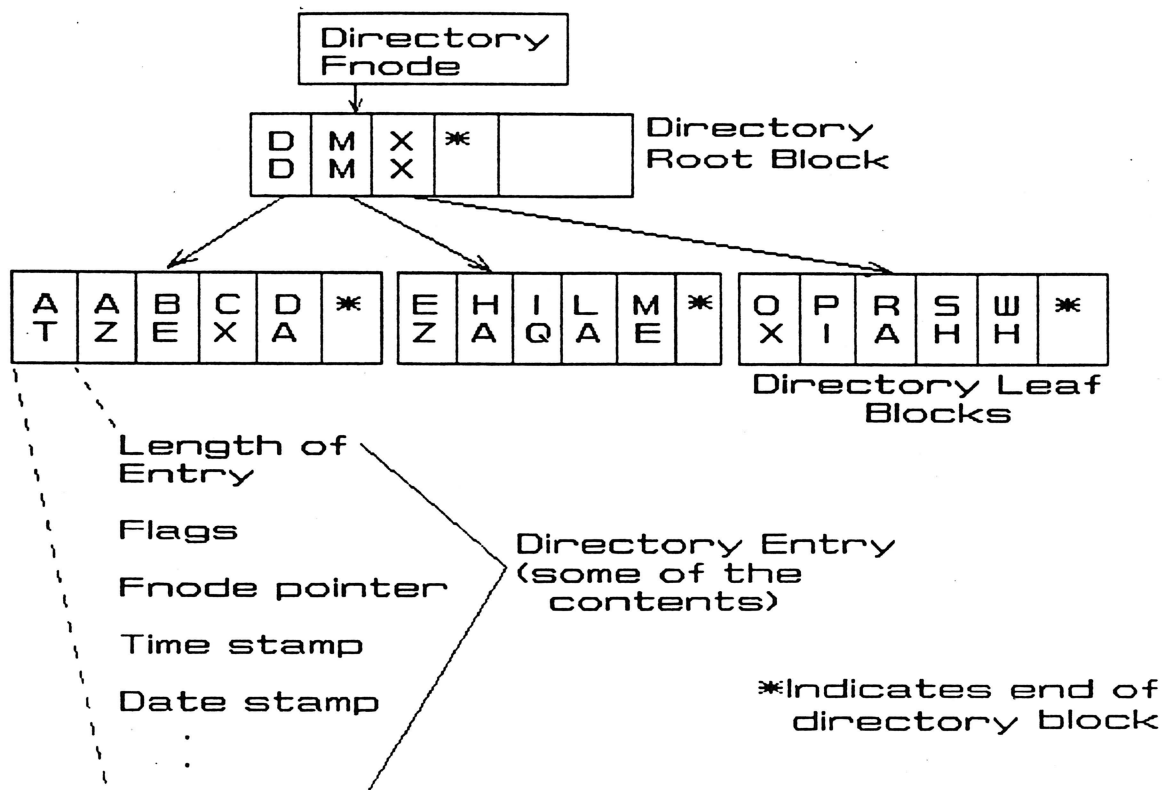
The remainder of the disk is divided into 8MB bands. Each band has its own free space bitmap in which a bit represents each sector. The bitmaps are located between alternate bands; thus the maximum contiguous space that can be allocated to a file is 16MB. One band, located toward the seek center of the disk, is called the Directory Block Band.

Every file or directory on an HPFS volume is anchored on a system object called an **Fnode**. Each Fnode occupies a single sector and contains control and the following access history information that is used internally by the file system:

- Extended attributes
- The length and first 15 characters of the name of the associated file or directory
- An allocation structure.

Each Fnode is always stored near the file or directory that it represents.

# Directory Structure



P72FS030

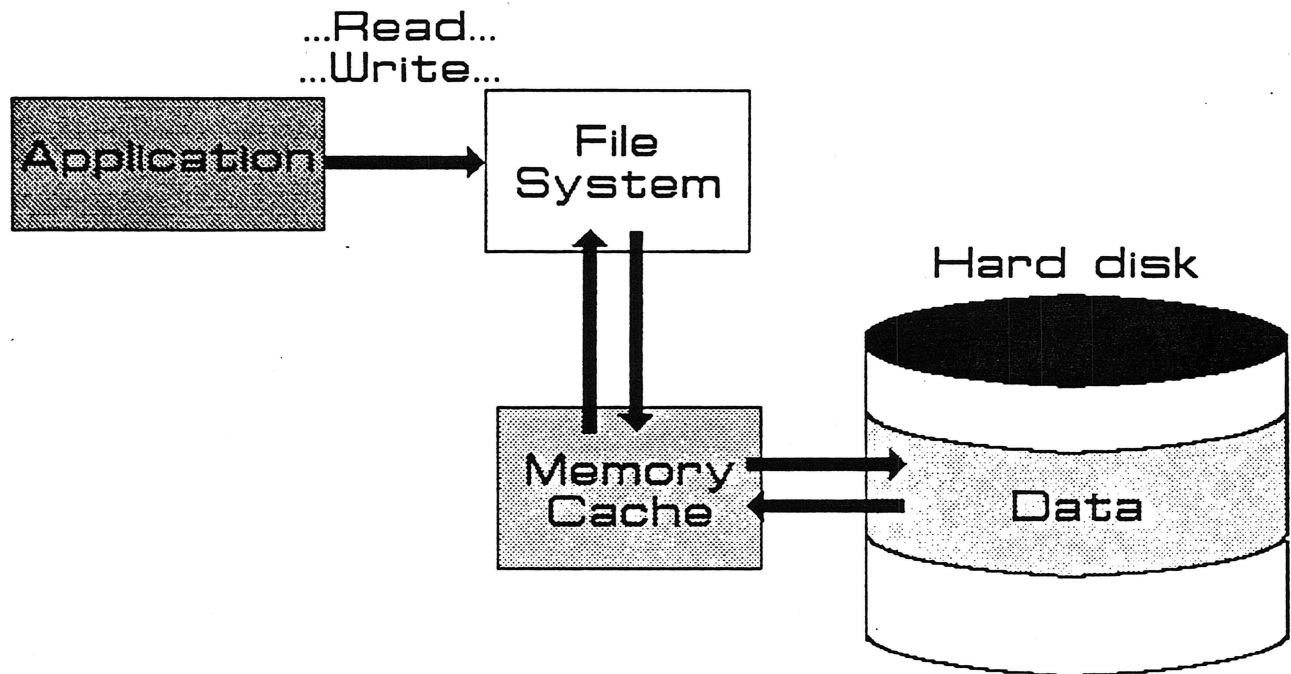
## Notes:

Directories can grow to any size and are built up from 2KB directory blocks which are allocated as four consecutive sectors on the disk. The file system will attempt to allocate directory blocks in the directory band, which is located near the seek center of the disk. Once that directory band is full, the directory blocks are allocated wherever space is available. Each 2KB directory block contains from one to many directory entries. A directory entry will contain information about the entry.

The entries in a directory block are sorted by the binary lexical order of their name fields. The last entry in a directory block is a dummy record that indicates the end of the block.

When searching for a specific name, the file system goes through the directory block until it either finds a match or finds a name that is lexically greater than the target. When found, the file system then extracts the Binary-Tree pointer from the entry.

# File System Cache



- "write-through enabled" bypasses cache.

F71HD110

## Notes:

Disk caching is the placing of frequently accessed data in a special buffer storage area in memory. This reduces access time and improves performance of applications that rely heavily on hard disk data. With OS/2, FAT and HPFS both use cache.

Both file systems support **Lazywrite** and **Autocheck**.

**Lazywrite** or "write behind" allows applications to continue without waiting for write operation to complete. Lazywritten data can remain in file system cache for several seconds after the application has completed the write operation.

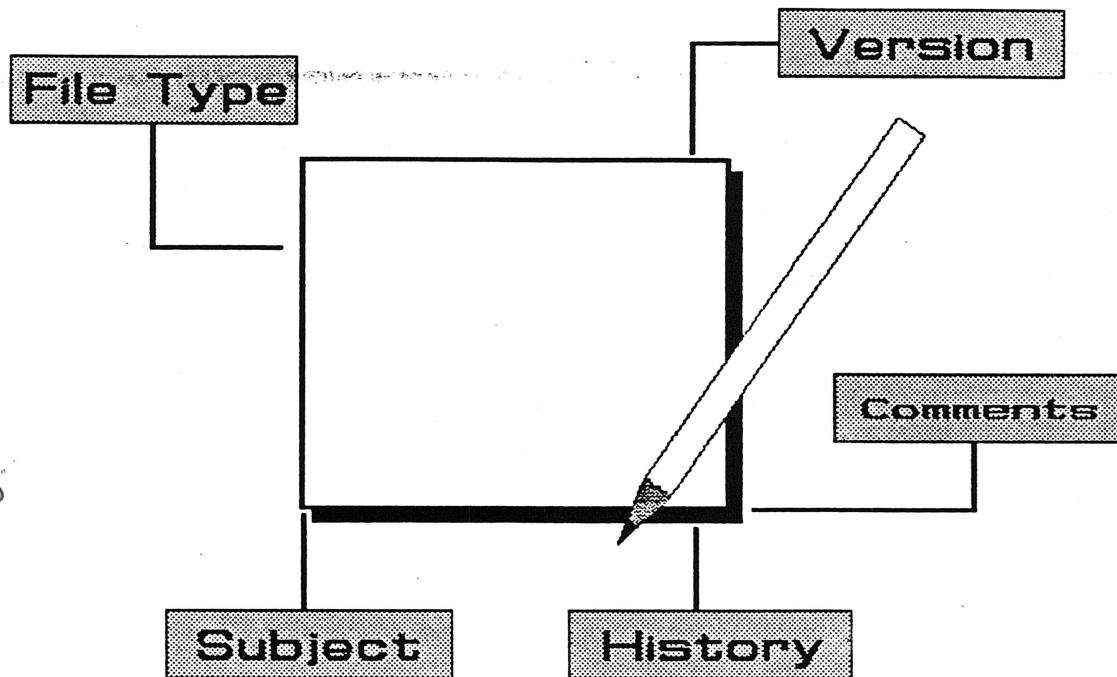
For integrity, files can be opened with WriteThru enabled; this will ensure that data is written to disk before the application continues. Disabling Lazywrite decreases performance and **does not** provide the same integrity as programming with WriteThru enabled.

Always use the **Shutdown** command to ensure all cache data is written to disk.

The **Autocheck** feature performs a CHKDISK /F at boot time to correct problems caused by improper system shutdown, such as files left open. - enabled if *CACHEing*

- *Bigger cache results in more swapping. Swapper not cached*

## Extended Attributes (EAs)



basic  
Attributes

- System
- hidden
- archive
- read only

P71HD150

### Notes:

DOS allows storage of only four attributes (system, read-only, hidden, archive) for each file. The HPFS file system extended this capability and provided ability to store many file attributes with the file. OS/2 2.x uses this feature to contain much data about an object in the Workplace Shell. The information contained in the Settings notebook of many objects, especially the file system objects, is stored in extended attributes. Information such as icons, the notebook settings, the status of the window created by an object (open or closed), etc., are contained in the extended attributes. Most of the information in EAs are written by the operating system, although applications can write information to them as well.

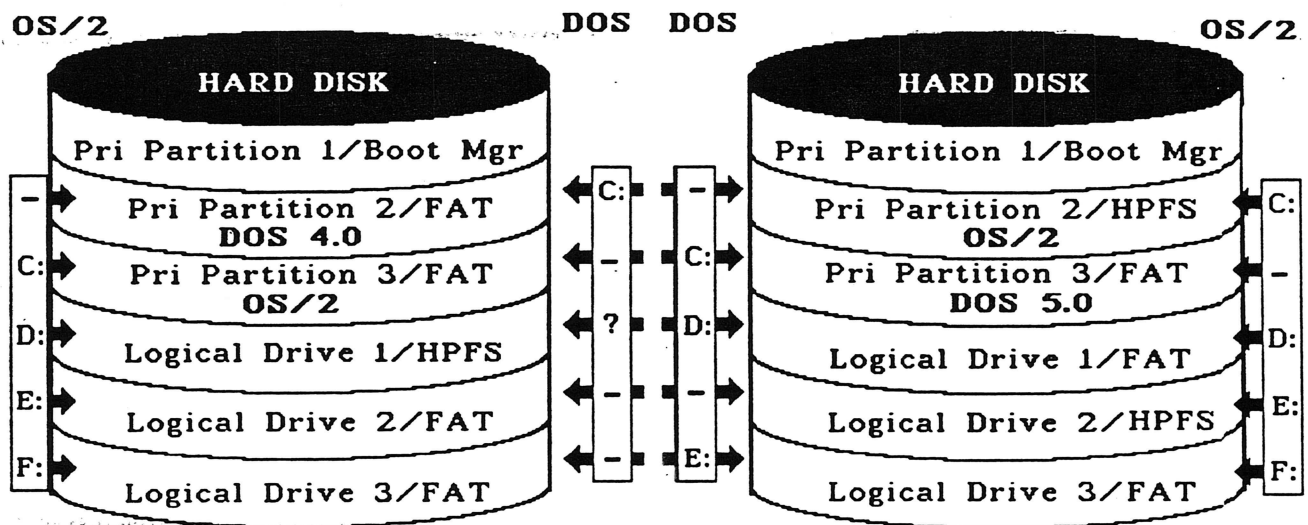
To maintain compatibility for the FAT file system, EAs for all files in a FAT partition are stored in a single hidden file, *EA DATA.SF*. Note that any diskette written to by OS/2 will also have this hidden file.

**TIP:** The **CHKDSK /F** command is used to repair extended attributes. This command cannot be performed in the OS/2 drive while it is running.

EAUTIL 15  
15 - one file at a time.



## File Systems – Co-existence



P71HD120

### Notes:

Emulated DOS under OS/2 can recognize HPFS partitions and drives, but native DOS cannot. This is an important consideration if you will be booting DOS on your system. Not only can native DOS not recognize an HPFS partition, if it encounters an HPFS partition or drive, it will not look any further (DOS versions prior to 4.01), or will skip the HPFS partition (DOS 4.01 and beyond).

In the left-hand example above, DOS 4.0 would not recognize any logical drives. This is because it would not recognize logical drive 1, and would not look any further. In the right-hand example, DOS 5.0 would recognize logical drives 1 and 3, but would access logical drive 3 using a different drive letter than the one used by OS/2.

**Tip:** If you will be running real DOS on your system and you will be using both FAT and HPFS file types, you generally want to place all FAT drives before the first HPFS drive.

## Two File Systems – Your Choice

	FAT	HPFS
File name length	8.3	Up to 254 characters
File name characters	Limited	Includes $\backslash$ , ?, etc.
File attributes	Separate file	Stored w/file
Max file size	2GB	2GB
Search algorithm	Sequential	Binary tree
Access by native DOS	Yes	No
Access by OS/2-DOS	Yes	Yes

P71HD130

**Notes:**

Note that DOS applications cannot access files with long names or containing illegal DOS characters.

## Two File Systems – Your Choice –Cont'd

	FAT	HPFS
≤6MB memory	Yes	No (uses 300+KB)
Overhead disk space	64KB per partition	5% of drive size
Asynchronous read ahead	Yes	Yes
Disk cache	Yes	Yes
LazyWrite	Yes	Yes
Auto check	Yes	Yes
Error recovery	Less	More
Fragmentation	More	Less

P21H0140

### Notes:

CHKDSK /F:2

/F:1

/F:0

/F:3 - rebuilds file structure.

## Checkpoint

1. You system has a 120MB hard disk and 6MB of memory. You will have only one partition. Which file system will you use? FAT

Why? Insufficient memory to support HPFS.

2. You need to back up a directory on an OS/2 FAT drive. Should you use a DOS back up program? No

Why? DOS backup programs don't recognize extended attributes

3. You have the following hard disk configuration:

C: DOS 5.0 FAT  
D: OS/2 2.1 HPFS  
E: application FAT

What drive letter is used for native DOS on Drive C: to access application data on the application FAT drive? D:

4. Do you think a DOS LAN requester can access data on an OS/2 LAN Server HPFS drive? Yes ✓ No        If so, why? OS/2 LAN server would get the data

and it supports HPFS

## Exercise 3.3 Working with Drives

### What This Exercise is About

Sometimes a customer requirement can best be met by changing the disk layout. In this exercise, you will make modifications to a given hard disk to meet a given customer requirement.

### What You Should Be Able To Do

At the end of this exercise you should be able to:

- Install and configure the Boot Manager.
- Create a second bootable drive to install OS/2.
- Discuss the impact of managing data between FAT and HPFS systems.

### Problem Statement

Six months have passed since you installed OS/2 for the secretaries at XDS. Your company has volunteered as a beta test site for an upgrade version of the OS/2 software. You need to provide a test environment for the upgrade, but do it on production machines without impacting daily work.

	<u>Drive</u>	<u>Use</u>	<u>Size</u>
<u>Existing configuration</u>	C:	OS/2 2.1	30MB
	D:	Applications and data	35
	E:	Unused	95
<u>New additions</u>	Boot Manager		1 (Required for Boot Mgr.)
	E: logical drive	Test OS2	30 (Required for install of upgrade)
	F:	Test data	Remaining space

How will you add the Boot Manager and the F: drive? Boot manager at end of

free space, E: at beginning, F: remaining.

Where must you put the Boot Manager? end

## Exercise Instructions

Install the Boot Manager and Create the Test OS2 drive.

- \_\_\_\_ 1. Delete the E: drive
  - Start the FDISKPM utility by entering **FDISKPM** from an OS/2 prompt, or by selecting **Create partition** from the Drives object pop-up menu.
  - Select the **E:** partition.
  - Select the **Delete partition...** entry from the **Options** pull-down menu.
- \_\_\_\_ 2. **Install Boot Manager** at the end of the free space.
  - Select the **Free Space** entry.
  - Select **Options** on the action bar.
  - Select **Install Boot Manager**.
  - Select **End** and press **Install**.
- \_\_\_\_ 3. Verify the Boot Manager is **Startable**.
- \_\_\_\_ 4. Create a new **logical** drive, **E:**, size **30MB**.
  - Select the **Free Space** entry.
  - Select **Options**.
  - Select **Create partition**.
  - Set size to **30MB** and select **Logical**. Press **Create**.
- \_\_\_\_ 5. Create another **logical** drive, **F:**, using the remaining free space.

### Configure the Boot Manager.

- \_\_\_\_ 1. Configure Boot Manager startup options so that the primary **OS/2** partition starts by default after 20 seconds.
  - Using the keyboard or mouse, select the **C:Primary** partition.
  - Select **Add to Boot Manager** menu from the **Options** pull-down menu.

- Name the drive **OS/2 2.1** and press **Set**. Note the **status** of the drive is set to **bootable**.
- Select **Set Startup Values** from the **Options** pull-down menu. Select the OS/2 2.1 drive as the default drive in the **Startup Default** listbox.
- In the **Startup Display Timeout** section, select the **Timed** radio button.
- Change the timeout to **20 seconds**.
- Change the display mode from normal to advanced by selecting the **Advanced** radio button.
- Save these changes by pressing the **Set** button.

\_\_\_\_ 2. Add the newly created E: logical drive to the Boot Manager menu and name it **TEST OS2**. You will install OS/2 on this drive later.

- Select the **E:logical** entry.
- Select **Add to Boot Manager menu...** on the **Options** pull-down menu.
- Name it **TEST OS2** and press **Set**.

\_\_\_\_ 3. Close the FDISKPM utility.

- Select **Exit** on the **Options** pull-down menu.
- Press the **Save...** pushbutton to close the FDISKPM utility.

\_\_\_\_ 3. Perform an orderly shutdown of the system.

\_\_\_\_ 4. Reboot the system.

- Restart the system by pressing **Ctrl, Alt, and Delete**. The system restarts, with Boot Manager displayed in Advanced mode. Select the OS/2 2.1 entry, or allow this drive to be started after a 20-second delay.



## **Exercise 3.4 Working with the File System**

### **What This Exercise is About**

You just created two new drives. Now, you will format them.

### **What You Should Be Able To Do**

At the end of this lab, you should be able to:

- Format a drive using the Workplace Shell.

## Exercise Instructions

### Format a Drive.

- \_\_\_1. Format the **Drive F** for **HPFS**.
  - Open the **Drives** folder.
  - Display the pop-up menu for the **Drive F** object.
  - Select **Format disk....** The Format Disk window is displayed.
  - Type **DRIVE\_F** in the **Volume Label** entrybox. Select the **HPFS** radio button to format the drive as HPFS.
  - Press the **Format** pushbutton to format the drive.
  - When the operation is complete, press **OK** and then **Cancel**.

- \_\_\_2. Format **Drive E** for **FAT**.

Note: The FORMAT command can be used at a command prompt:

To format an HPFS drive: `FORMAT F: /FS:HPFS`

To format a FAT drive: `FORMAT E:`

- \_\_\_3. Close open windows and put shadows of **Drive E** and **Drive F** on the desktop for easy access.

- \_\_\_4. Perform a system **shutdown**.

**Optional - Observe the way long file names are changed when you move files from an HPFS drive to a FAT drive.**

- \_\_\_1. Insert the **Student Diskette** in Drive A. Use drag and drop to copy **MYFILE** from the diskette to **Drive F**.
  - Open the **Drive A** object and copy **MYFILE** to Drive F by dragging it from the open Drive A window to **Drive F**.
- \_\_\_2. Open **Drive F** and open the **Settings** notebook of **MYFILE**. Check the **file** page for the "physical" name of the object (the name of the object known to the file system).

Is the file name the same as the **title** of the object ( on the General page or below the icon)? yes

Close the Settings notebook.

- \_\_\_ 3. Change the name of MYFILE to a long file name, **MY NEW FILE**, using ALT+MB1 on the icon title. Open the Settings notebook.

What happened to the physical file name? Terminated at 8 chars and underscores added where spaces were.

Why? DOS running from FAT

- \_\_\_ 4. Close the Settings notebook.

- \_\_\_ 5. Drag **TEXT.DOC** from Drive A to **Drive F**. Rename it to a long name, **Text Document**, deleting the file extension.

When prompted to keep the file extension, answer **No**. When prompted to keep associations, answer **No**. (This message appears only if the file has associations.)

Note: If you rename a file and delete an extension, OS/2 recognizes that this may mean an application which requires a particular extension will not work properly. Similarly, associations are used to facilitate application execution.

- \_\_\_ 6. Start an OS/2 command prompt Go to **F:** and type **DIR**.  
Are all the files listed? \_\_\_\_\_

- \_\_\_ 7. Use the **REN** command to rename the **Text Document** file you created to "**My text file**". The " " (double quotes) are required if the name has blanks.

- **REN "Text Document" "My text file"**
- Enter a **DIR** command to verify the name change.

- \_\_\_ 8. Close the command prompt and go back to the **Drive F** folder.  
What happened to the title of the renamed Text Document file?  
\_\_\_\_\_

Open the object Settings notebook. What happened to the file name?

\_\_\_\_ 9. Move **MY NEW FILE** to **Drive E**. Check the file name.  
What happened? \_\_\_\_\_

\_\_\_\_ 10. Now move the file back to **Drive F**.  
What happened to the physical name? \_\_\_\_\_

\_\_\_\_ 11. Summarize your findings.

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\_\_\_\_ 12. Close open windows.



# Unit 4. Alternative Installations

## What This Unit is About:

Unit 2, Basic Installation, focused on basic installation which was defined as having only one operating system. This unit addresses the environment where the customer has:

- decided to keep, not replace, an existing operating system.
- needs more than one operating system available to meet requirements.

## What You Should Be Able To Do

After completing this unit, you should be able to:

- Describe Dual Boot and list steps performed to install it.
- Recommend use of Boot Manager or Dual Boot given a set of user needs.
- Compare and contrast advantages and uses of Boot Manager and Dual Boot.
- Plan for installation of OS/2 on existing DOS or OS/2 systems, recommending the appropriate solutions to meet customer's needs.

## How You Will Check Your Progress

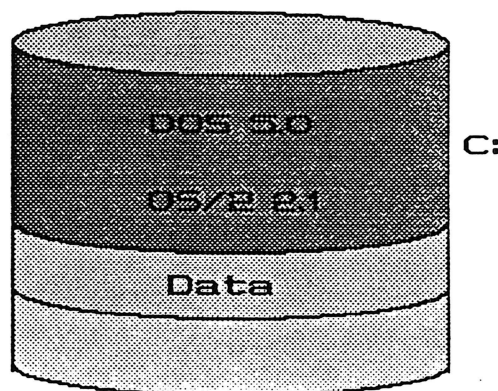
- Checkpoint
- Case studies

## References

- *OS/2 2.1 Using the Operating System*, Chapter 30, Moving from Previous Versions of OS/2
- *OS/2 2.1 Installation Guide*, Chapter 3, Adding OS/2 2.1 to a DOS System; Chapter 4, Installing Multiple Operating Systems

## DOS and OS/2 – Dual Boot

- DOS on C:
- Space for OS/2 on C:
- C:\ contains only
  - hidden files
  - CONFIG.SYS
  - AUTOEXEC.BAT
- BOOT /DOS or OS2



P71M0822

### Notes:

In Dual Boot, both DOS and OS/2 are on the same primary partition. This is achieved by having DOS 3.2 or later installed in a primary partition, preparing the DOS system, and then installing OS/2 on the same partition without formatting. You can switch between the two operating systems by typing commands at a command prompt. When you reboot your system later, it will reboot into whichever operating system was active when you shut down.

Dual Boot is accomplished by saving the active system's CONFIG.SYS and AUTOEXEC.BAT files and restoring the alternate operating system's files, and then doing a warm boot. The files are in \OS2\SYSTEM and are named CONFIG.OS2, AUTOEXEC.OS2, CONFIG.DOS, and AUTOEXEC.DOS.

The *OS/2 2.1 Installation Guide*, Chapter 3, "Adding OS/2 2.1 to a DOS System," contains detailed steps to prepare a DOS system so that Dual Boot will operate properly. Move all DOS files except CONFIG.SYS, AUTOEXEC.BAT, COMMAND.COM and the two DOS hidden files to a subdirectory, e.g. C:\DOS. In the root, modify CONFIG.SYS and AUTOEXEC.BAT to point to the subdirectory including the following:

- Modify CONFIG.SYS: Shell=C:\DOS\COMMAND.COM
- Modify AUTOEXEC.BAT: Set COMSPEC=C:\DOS\COMMAND.COM  
Path=C:\DOS  
Copy C:\DOS\COMMAND.COM C:\>NULL



## Comparisons – Dual Boot, Boot Manager

	Dual Boot	Boot Manager
DOS preinstalled	Yes	No
DOS & OS/2 on same drive	Yes	No
Select system at startup	No	Yes
Boot from 2nd volume*	No	Yes
Multiple primary partitions	No	Yes
Must partition the disk	No	Yes
Preserve Windows settings	Yes	Yes

P71M0029

Notes:

## Planning Disk Space

Operating System	Space[MB]	Install drive
DOS	2 - 4	C
OS/2 1.3		C
- Standard Ed.	20	
- Extended Ed.	30	
OS/2 2.0	15 - 30	C
OS/2 2.1	20 - 40	any drive
Boot Manager	1	-

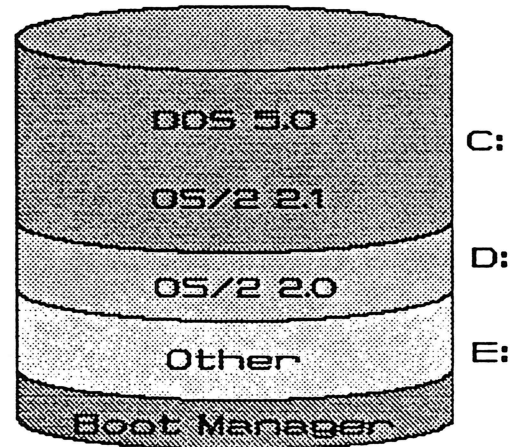
P71M0026

### Notes:

The OS/2 Standard Edition consists of base OS/2 code (16 bit). OS/2 Extended Edition contains base OS/2 function, provided in the OS/2 Standard Edition, plus the Communications Manager, Database Manager, and LAN Requester.

## Installing More Than One Operating System

- Boot Manager
- Dual Boot
- Can have both!



P71M0010

Notes:

## Install Considerations - Clean System

- Create multiple partitions
  - Minimum of 2 (one for OS/2 and one for Data and Applications)
  
- Create Boot Manager Partition
  - Install at end of disk (1 Meg in size)
  - Multiple versions of OS/2; provide easy migration
  - Multiple operating system types (e.g. DOS, AIX)

---

P71M0030

### Notes:

If the target machine is new, it must be prepared by the FDISK program to receive the operating system. If the installation is started on a 'clean' system, the FDISK program will create a primary partition of the full size of the physical hard disk unless you choose to modify the partition.

---

## Install Considerations – DOS System

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- Determine if need to preserve real DOS
  - Applications
  - Space on hard disk elsewhere
- Can Dual Boot be used?
  - Space for OS/2 in C:?
- Can Boot Manager be installed?
  - Space for OS/2 and Boot Manager
- Preservation of Windows settings and definitions

P21M0850

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**Notes:**

Note: DOS compression utilities may not be compatible with OS/2 file systems.

If the target system has DOS or DOS-and-Windows installed on it, you must decide whether or not to retain the DOS system through the use of the Dual Boot feature or the Boot Manager.

Dual Boot will be installed automatically if the installation program identifies that the partition into which OS/2 is being installed is bootable with DOS already installed.

The installation program also makes provisions for picking up the customization information for the existing Windows system and carrying that information forward to the WIN-OS/2 environment provided to support Windows applications in OS/2. To install Dual Boot and pick up the information from Windows; the hard disk must not be repartitioned or formatted during installation.

---

## Considerations—Existing OS/2 1.x System

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- Backup all important information
- Decide on which partition to install
- Format Install partition if possible
- OS/2 1.3 and 1.2 settings and defaults can be maintained
  - Groups preserved
  - Non-OS/2 2.1 device drivers remarked out
- Existing applications will be migrated
- Must install ES and LS as required

P71M0040

### Notes:

If the target system is an OS/2 Version 1.3 system, the installation process will clean up the unused system files and directories and pick up all of the customization information from the existing OS/2 system.

- Redundant directories and files are cleaned up.
- Duplicate files are replaced and updated.
- New files and directories are created.
- Groups and application properties are carried over.
- Desktop customization is carried over.
- Existing printer drivers will be updated.

---

## Considerations—Existing OS/2 2.0 System

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- Format if possible
  - But LAN and ES code may be on OS/2 install drive
- May need up to 6MB more disk space
  - WIN-OS/2 increased 5MB, but can be installed on other drives
- CONFIG.SYS preserved
  - Non-OS/2 2.1 device drivers are preserved
  - New device drivers replace old

P71M0832

**Notes:**

When installing over prior versions of OS/2 without formatting the partition, device drivers recognized as prior OS/2 version device drivers are remarked out and statements are added for their replacements. Non-OS/2 drivers remain in the CONFIG.SYS. In addition, a file consisting only of OS/2 2.1 device drivers is created and stored as OKCONFIG.SYS in the OS2\INSTALL subdirectory. If a problem is encountered in the migrated CONFIG.SYS file, OKCONFIG.SYS can be recovered by booting with the installation diskette, inserting Diskette 1 when prompted, and exiting (Esc) to a command prompt. OKCONFIG.SYS can then be copied to the root directory of the OS/2 bootable drive and renamed CONFIG.SYS.



## Existing OS/2 2.0 System – Continued

- 2.0 Desktop preserved
- Install all desired OS/2 features
  - All previous features deleted
- WIN-OS/2 Version 3.0 deleted
  - WIN-OS/2 Desktop and INI files migrated
- Installed 2.0 printer drivers updated

---

P71M0034

Notes:

## Checkpoint

1. Your machine has a single C: drive with both native DOS and OS/2 installed on it (Dual Boot). How do you:
  - (a) switch from OS/2 to DOS BOOT /DOS
  - (b) switch from DOS to OS/2 BOOT /OS2
  - (c) Which operating system will boot at power up time? last one running at shutdown.
2. You are installing OS/2 2.1 over an existing OS/2 2.0 system without formatting.
  - (a) Your 2.0 system already has all fonts and documentation. Should you select fonts and documentation to be reinstalled? yes
  - (b) Installing 2.1 over 2.0 will preserve the WIN-OS/2 3.0 environment.  
     True   ✓   False - desktop will be preserved
3. A system may have both Dual Boot and Boot Manager installed.  
  ✓   True      False

## Exercise 4.1 Case Study: Existing DOS System

### Current Environment

- Your customer has a 245MB hard disk with a single C: drive formatted FAT.
- DOS, Windows 3.1, and OS/2 2.0 are installed with all features. The DOS and Windows 3.1 code use about 12MB of disk space: OS/2 2.0 uses about 30MB and a 15MB swap file.
- All applications, with the exception of a Windows 3.1 application, can be run under OS/2 2.0.
- The disk is 85% full. *60MB prog. - 150 MB - applications*
- The system has 16MB memory.
- Performance has been degrading recently.

The customer is expecting you to recommend a solution to improve performance on the system and to allow for future growth. The customer has expressed interest in OS/2 2.1. What will you recommend? Use the following questions to analyze this question:

### WILL YOU KEEP OR REPLACE THE EXISTING SYSTEM?

1. How does the customer currently run the Windows 3.1 application?

DOS/Windows - dual boot

2. Will you need to keep DOS, Windows 3.1, or OS/2 2.0 to meet the customer's requirement? NO

3. How will you address the performance issue? What do you think may be contributing to the performance problem?

FAT file structure, Fragmentation

4. Can OS/2 2.1 be added to this system? YES

5. Is there sufficient memory and disk space to support current needs? YES with cleanup

6. Is there sufficient space to install all features of OS/2 2.1? YES after cleanup

**WHAT IS YOUR PROPOSED DISK LAYOUT?**

1. What is the drive layout?

C: Primary / D: Logical / E: Logical / BOOT

2. How will each drive be formatted?

60m Prim 20m Log 174 Lg  
C: FAT / D: ~~unformatted~~ FAT / E: HPFS / BOOT  
SWAP

3. What provision should be made for future growth?

4. How is the performance issue addressed?

HPFS for application

5. Where will you put the swap file?

D:

6. Where will you put OS/2 2.1? Will you put Win-OS/2 on the same drive?

C: / yes.

7. Are there other considerations not addressed in the problem description?

## Exercise 4.2 Case Study: Expand OS/2 1.3 Extended Edition Systems Used By System Test Staff

### Current Environment

Your customer has a support team that tests applications. These testers use a LAN for print and messaging. At this time, they do not use the LAN for file serving. Access to the server is currently provided by the OS/2 1.3 Extended Edition LAN Requester.

The customer is upgrading their application to run on OS/2 2.0 and OS/2 2.1. They will continue support for the OS/2 1.3 application. The customer wants to put the 3 platforms on each test machine.

The customer requires only the minimal OS/2 system to test their application. They do not need online references, productivity tools, etc.

- Your customer has a 245MB hard disk with a C: drive of 60MB, formatted FAT.
- The D: drive has 130 MB of programs and data and is formatted HPFS.
- The remaining space is E:, 55 MB and is used for miscellaneous tools.
- DOS and OS/2 1.3 Extended Edition are installed on the C: drive; Extended Edition includes its base code and the LAN Requester code.
- The C: partition has a swap file which is typically about 5 MB.
- The system has 16MB memory.
- Performance is satisfactory.
- It has been determined that the OS/2 2.0 support needed will take about 15MB of disk space, not including a swap file.

What will you recommend? Use the following questions to analyze this question:

1. How much disk space is required for the OS/2 2.1 minimal system?

20 mb

2. What is the total amount of space which must be available to install OS/2 2.0 and OS/2 2.1 and have access to both?

15mb + 20mb = 35 mb      - 50 meg

3. What will you do about the swap file for OS/2 2.0? For OS/2 2.1?

Can be shared between versions

4. How will you get the space needed?

More food to eat and get rid of E:

5. Are there other considerations not addressed in the problem description?





## Unit 5. Installing and Configuring Printers

### What This Unit is About

You may install one printer during OS/2 installation. In this unit, you will install additional printers and customize them.

### What You Should be Able to Do

After completing this unit, you should be able to:

- Identify and describe the purpose of OS/2 printer objects.
- Create a printer object in the Workplace Shell.
- Install printer drivers for the OS/2 and WIN-OS/2 environments.
- Configure printer object settings in the Workplace Shell.
- Configure printer settings in WIN-OS/2.
- Describe pooling and sharing.
- Manage print output.

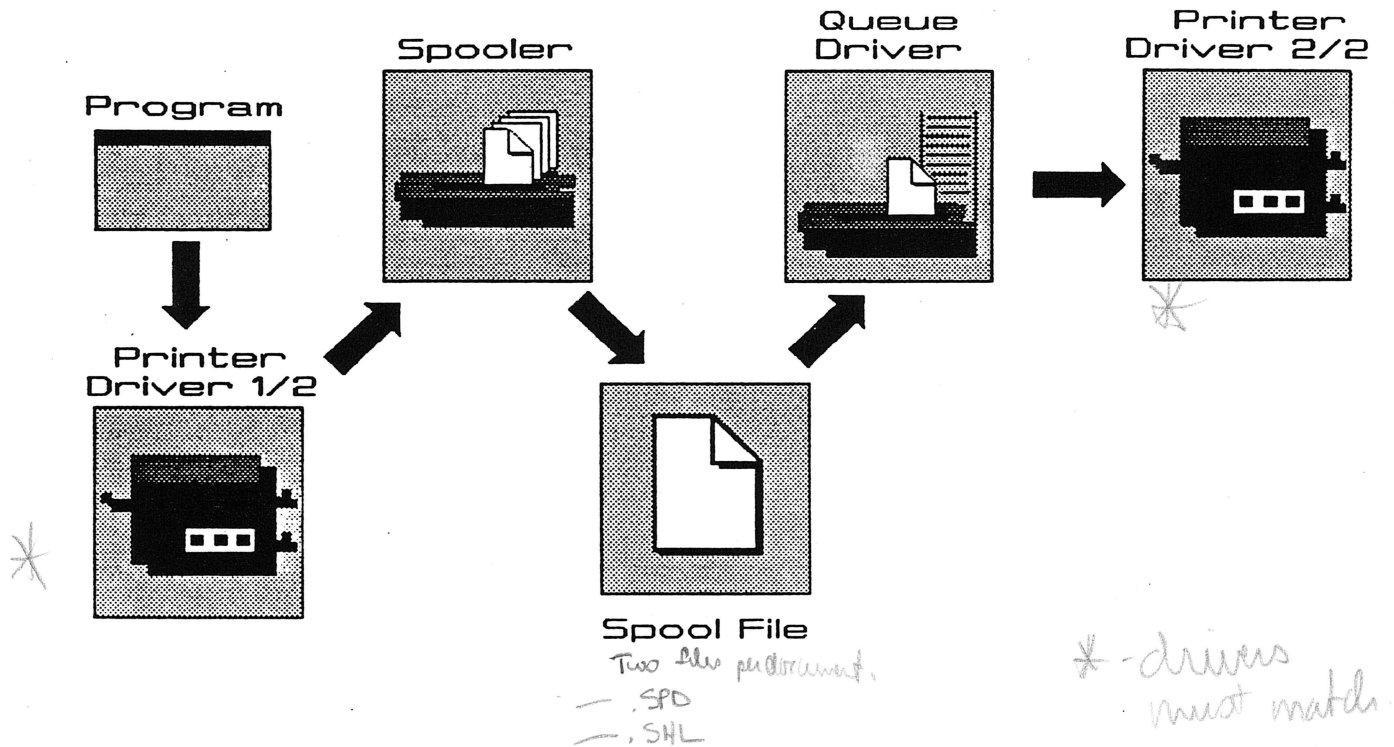
### How You Will Check Your Progress

- Checkpoint
- Apply skills in exercises

### References

- *OS/2 2.1 Using the Operating System*, Chapter 16, Printers and Plotters (S61G-0703-00)
- *OS/2 2.0 Volume 5: Print Subsystem*, (52G9942)
- *OS/2 2.1 Technical Update*, (SG24-3948)

## Printing Data Flow



P71PR020

### Notes:

The normal print flow is as follows:

Program --> Printer driver --> Spooler --> Queue Driver --> Printer Driver --> Printer

In a multitasking system, two programs may be sending print output to the same printer. The **spooler** takes the data processed and output by the printer driver and places it in the \SPOOL file on the disk. The data stays in this file until the Queue Driver determines the needed port is available.

The **queue driver** takes the files and sends them, one by one, to the appropriate port.

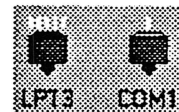
The **printer drivers** convert and format the print information for specific printers.

*Use IBMnull driver if you don't have an OS/2 match for DOS printer driver*

## Printer Objects

- OS/2

Printer  
Job  
Printer Driver  
Port  
Queue Driver  
Spooler



- WIN-OS/2

Print Manager  
Control Panel



P71PR010

### Notes:

Printing support is provided for DOS, OS/2, Presentation Manager, Print Screen, Print Commands, and drag and drop through a new user interface designed to work in conjunction with the Workplace Shell.

Windows compatibility is provided by a separate set of functions that look identical to their Windows counterparts except that they use the full functionality of the OS/2 print subsystem. Separate WIN-OS/2 drivers are required because Windows programs are written to Windows APIs (Application Program Interfaces), understood by the Windows printer driver and not the OS/2 Presentation Manager.

## Print System Objects - Descriptions

**Printer objects** — During OS/2 installation, if you installed a printer, an icon called a Printer Object was added to your desktop to represent the local printer. Each printer object has a single print queue. A printer object can represent several physical printers and/or ports which can accept a print job queued to the printer object.

**Job** — Job objects are the print jobs that the user is sending to the attached printer. Print jobs can be represented as either icons or text lines depending on the view of the object.

**Printer driver** — Each printer connected to your system requires at least one printer driver. Printer drivers provide information that enables the operating system to create a data stream appropriate to the particular printer model you select.

**Port** — The port object represents the port driver and is specified in a printer object Settings Notebook. Ports can be divided into three classes.

- (1) Physical ports such as LPT1 or COM1.
- (2) Logical ports for networking such as LPT4, etc.
- (3) Installable new ports, e.g., COM10, COM11.

OS/2 supplies port drivers for parallel ports LPT1 through LPT3 and serial ports COM1 through COM4.

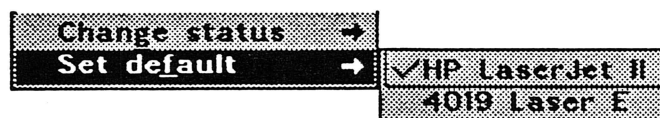
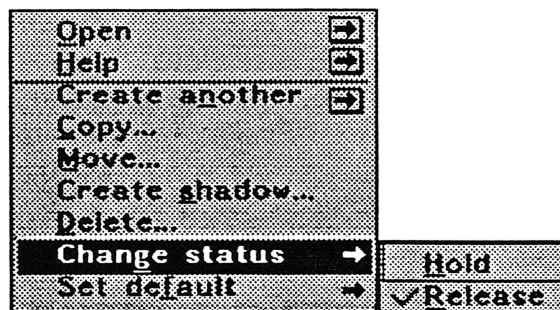
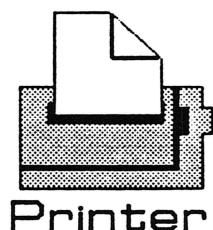
**Queue Driver** — The Queue driver works in conjunction with the spooler to pass queued print jobs to the printer driver. Two queue drivers are shipped with OS/2: PMPRINT and PMPLOT.

**Spooler** — The Spooler object resides in the System Setup folder. It represents the settings of the OS/2 spooler and not its contents. Note: The OS/2 spooler, when enabled, handles all OS/2 jobs as well as all WIN-OS/2 jobs. The spooler's purpose is to take print jobs from the print queue and write them to a holding area on the hard drive.

**WIN-OS/2** — WIN-OS/2 print support provides print functions for Windows applications and works in conjunction with OS/2 print management. If the OS/2 print spooler is enabled, then all Windows print jobs pass through the WIN-OS/2 interface to the OS/2 print spooler. The Win-OS/2 Print Manager is not used.

WIN-OS/2 Print Manager and Control Panel provide the management and configuration options respectively for printing from WIN-OS/2 applications. The ATM (Adobe Type Manager) Control Panel is used to manage fonts for WIN-OS/2 printers.

## Print Management -- Printer Pop-up



- Change status holds or releases the print queue
- Set default chooses a new default printer

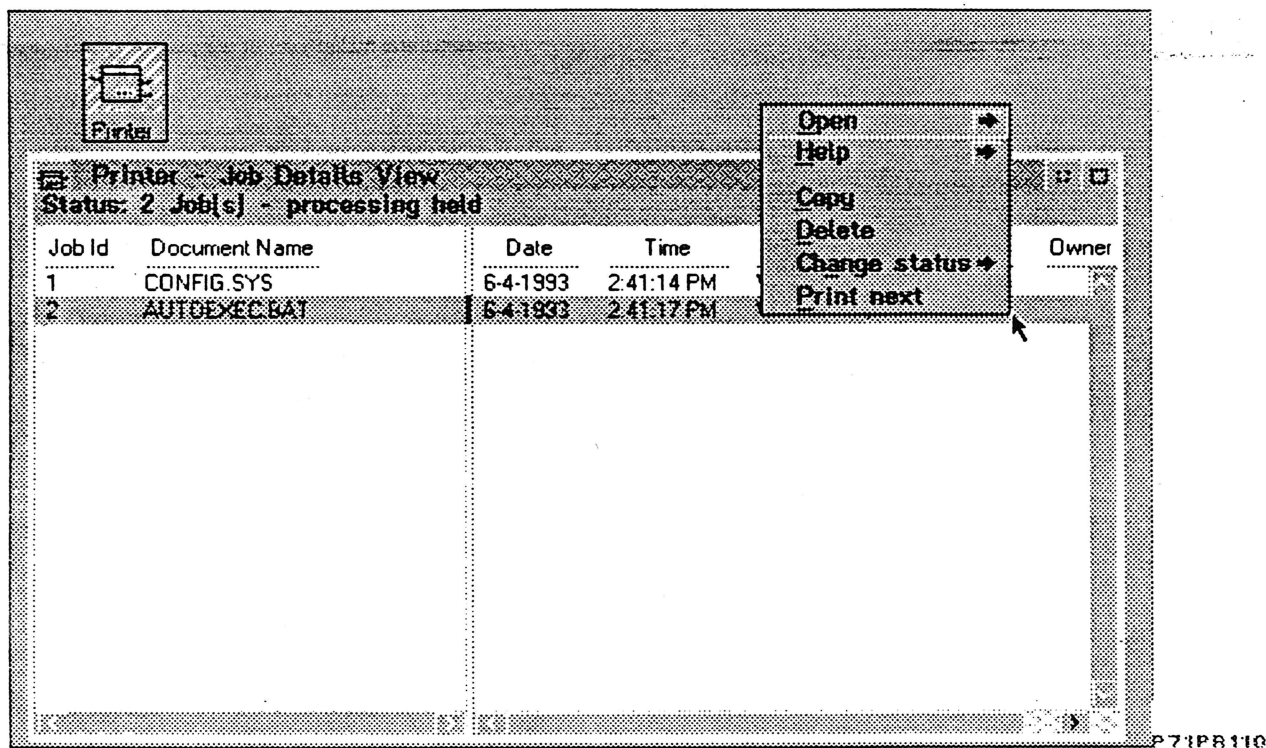
P71PR100

### Notes:

The pop-up menu for a printer object allows you to hold or release the print queue.

When a printer object is not selected through a program or pop-up menu, the print output always goes to LPT1. An example is a PRINT command issued from a DOS or OS/2 command session. The **Set default** option of any printer object can be used to select any printer object using the LPT1 port as a destination for the output.

## Managing Print Output—Job Pop-up Menu

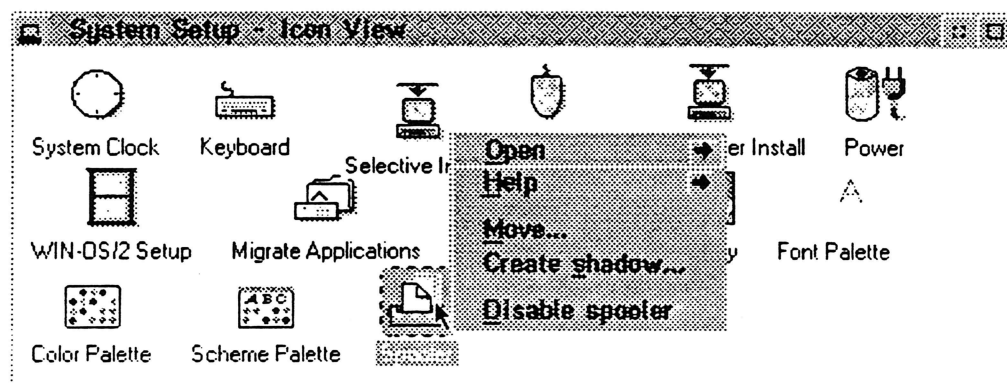


### Notes:

Jobs which are currently in a printer object's queue can be viewed by opening the printer object from the desktop.

Jobs in a queue are objects, and may be manipulated by displaying their pop-up menus. Individual jobs may be viewed (via **Copy**), copied, deleted, held or released, or moved forward in the queue (via **Print next**).

## Controlling the Spooler



P71PB120

### Notes:

To disable the print spooler, select **Disable spooler** from the Spooler object's pop-up menu (this object is in the **OS/2 System folder**).

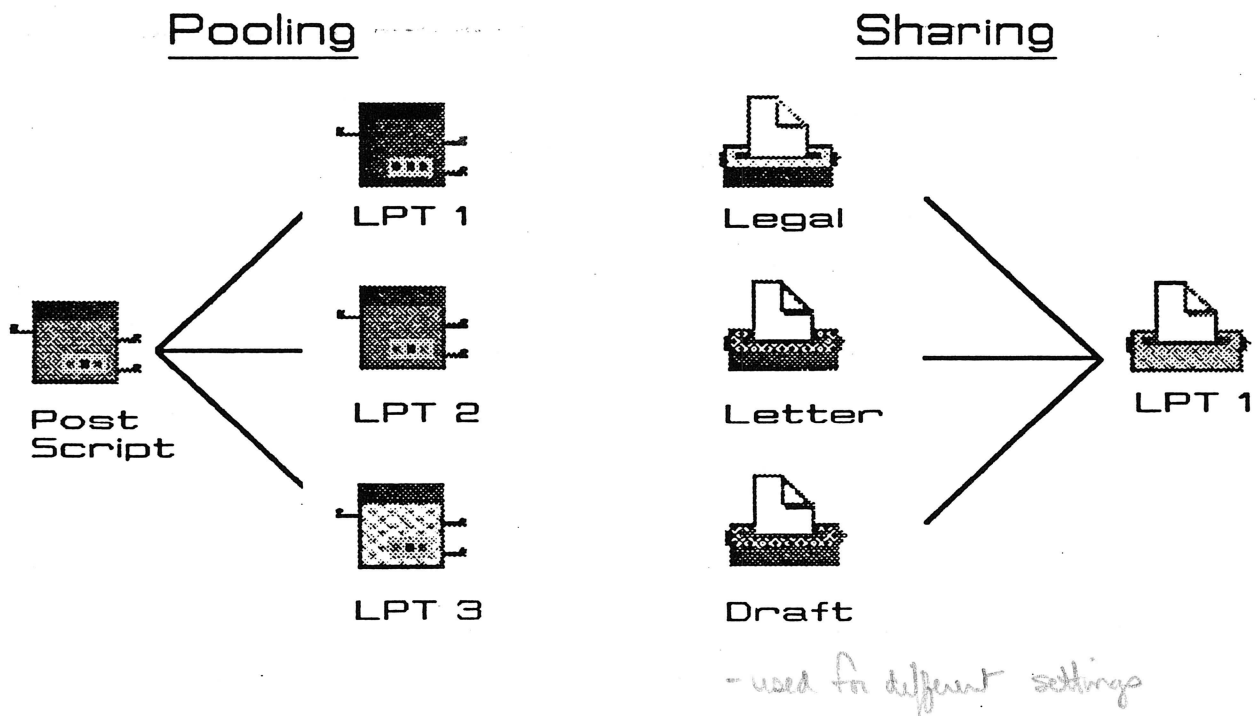
Disabling the spooler will speed up printing as the spooler will be bypassed and the spool file will not be created. Also, because the file is not created, this option is good for systems with very little hard disk space. The spooler should be disabled **only** if you will not be printing from multiple jobs simultaneously. If you disable the spooler and print from multiple jobs, the print information can be mixed and unreliable output will be obtained. If the spooler is disabled and you lose power, your job may be lost.

Print jobs may be given a higher priority by setting a Print Priority value. Since this priority applies to all printing, this action may slow interactive response time on the system.

Spool files can become very large. Printing a bitmap can easily result in a spool file of 10MB. Consider this when planning disk space for your system.



## Pooling and Sharing



P71PR090

### Notes:

**Print pooling** refers to the attachment of several printers to the same queue. If you do a lot of printing, especially of large or slow jobs, you can attach several printers to the same queue. As the spooler receives each job, it routes the job to the next available print drive. This might be effectively used on a LAN print server.

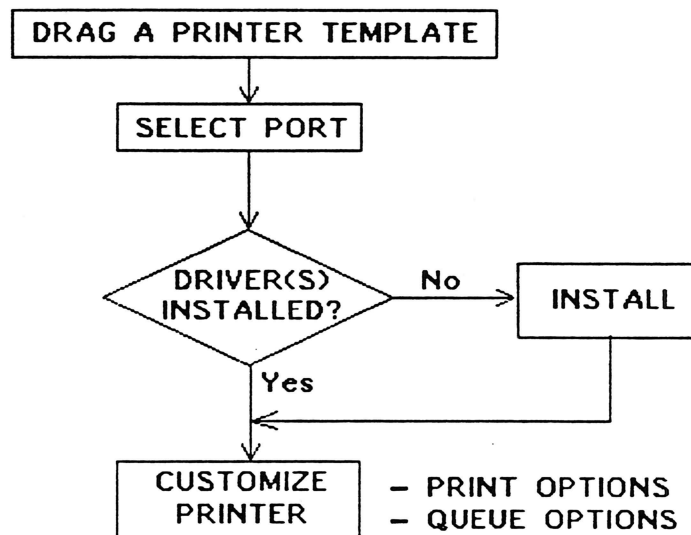
In the above pooling example, the LPT3 printer would be chosen first and LPT2 next, etc. This means that it would be wise to place your fastest printer on the highest port address.

**Print sharing** refers to the attachment of one printer to multiple print queues. If you have several workstations attached to a LAN, for example, you may have a single printer on the LAN server. Each workstation has its own print queue; all the queues share the single printer.

Note that in sharing one printer with multiple print objects, some settings might require a PHYSICAL change to the printer such as changing the paper in a tray from Letter to Legal.

## Installing Printers

- One printer during OS/2 installation
- Additional printer objects



P21PR032

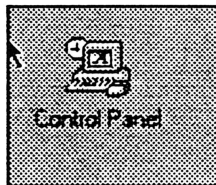
Notes:

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## WIN-OS/2 Print Support

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- WIN-OS/2 printer drivers must be installed
- Use Control Panel – Printers to:



- Install printer drivers
- Connect to ports
- Setup print output properties

- Print Manager provided

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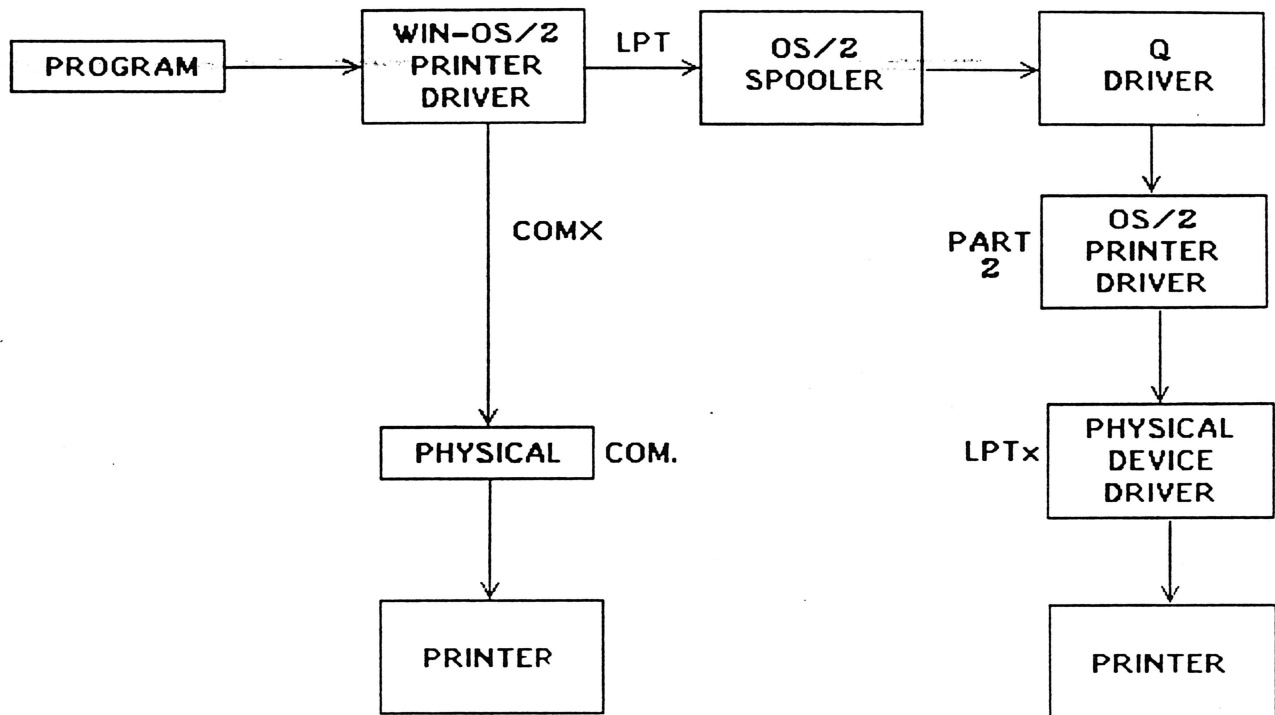
### Notes:

When a print object is created and you have selected the printer driver to be used, often you are prompted to install the matching WIN-OS/2 driver.

In cases where you need a unique WIN-OS/2 driver and no corresponding OS/2 driver is available, use the WIN-OS/2 Control Panel - Printers utility to add the driver. Create a corresponding OS/2 print object using the IBMNull driver, if you use the unique WIN-OS/2 driver for an LPT port.

In general, do **not** enable the Print Manager. Since all parallel port output goes to the OS/2 spooler, leaving Print Manager on increases overhead. If you will be printing **only** from WIN-OS/2 and do not want to go to the OS/2 desktop to manage print jobs, then disable the OS/2 Spooler, and turn on the Print Manager.

## WIN-OS/2 Print Data Flow

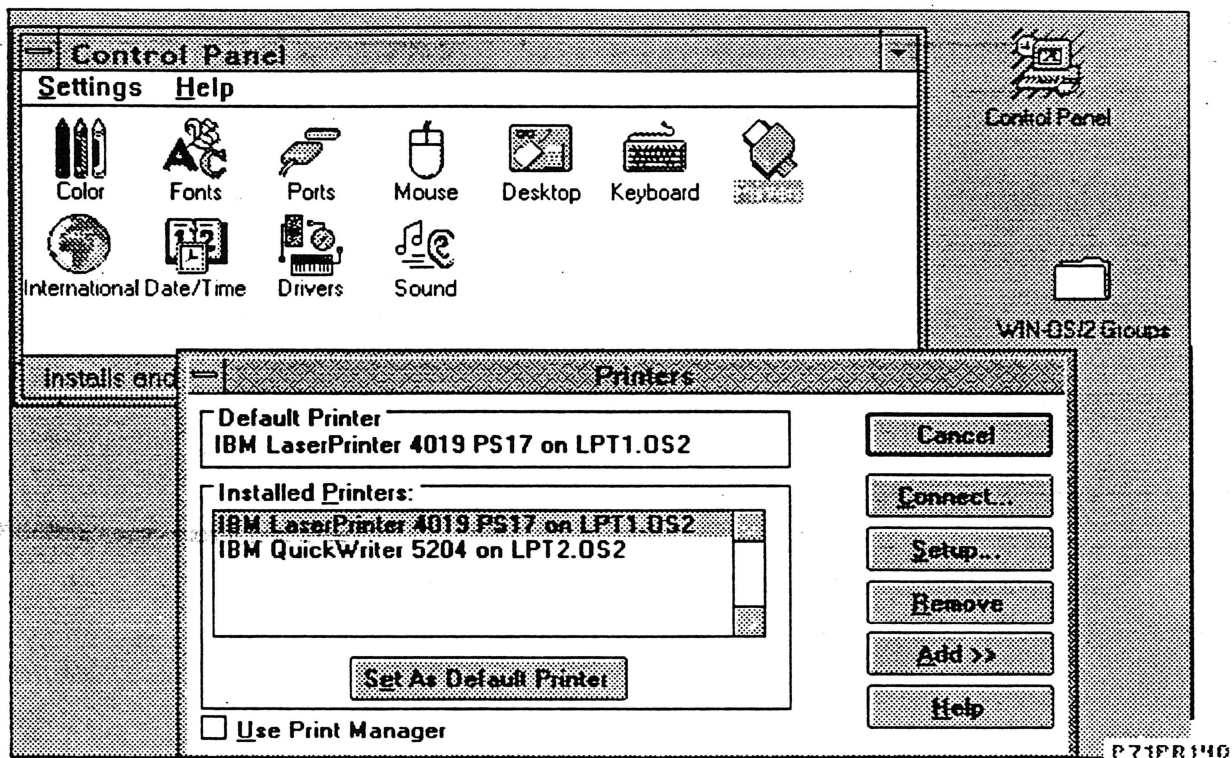


P71PR132

**Notes:**

WIN-OS/2 COM port output is passed directly to the serial port physical device driver.

## WIN-OS/2 Printer Installation



### Notes:

OS/2 determines if there is an equivalent WIN-OS/2 printer driver for an OS/2 printer driver by using the DRVMAP.INF file in the \OS2\MDOS\WINOS2\SYSTEM folder. If the default printer driver in the OS/2 printer object you are creating is listed there, you will get a dialog box asking you if you want to install the equivalent WIN-OS/2 printer.

Sometimes when you create an OS/2 printer object you will **not** be prompted to install an equivalent WIN-OS/2 printer driver. This is because the default printer driver for the OS/2 printer object you are creating is not listed in the DRVMAP.INF file. If you know that there is a printer driver in WIN-OS/2 that you can use with your printer, use the Control Panel of WIN-OS/2 to install it separately.

If you have many PCs with a printer(s) that is not listed in the DRVMAP.INF file, you might want to consider editing the file to include it.

## Checkpoint

1. Assigning multiple ports to a printer object, each port with identically configured printers, is called pooling.
2. Configuring multiple printer objects, each with different job properties and assigning them to the same port, is called sharing.
3. Where might you want to use the technique of having all the printer drivers on a hard drive?  
Server configuration
4. Why are separate printer drivers necessary for WIN-OS/2?  
Different calls issued in windows to perform print functions.
5. How is a print job deleted? Printer Pop-Up

## Exercise 5.1 Create and Install a Printer

### What This Exercise is About

One printer may be installed at OS/2 installation time. Additional printers may be added using techniques practiced in this exercise. In this exercise you will create two printer objects for one printer. The first printer object will be configured for the IBM 4019 Laser-Printer. The second will be configured for PostScript\*\*. This is an example of printer sharing - two printer objects, each configured differently, point to the same port.

### What You Should Be Able To Do

Upon completion of this exercise, you will be able to:

- Create new printer objects.
- Install printer drivers for OS/2 and WIN-OS/2.



## Exercise Instructions

Create a printer object using drag and drop. You may be installing from diskette, a local redirected drive, or from the LAN. Your instructor will tell you where diskette images are located. Note that you may be prompted for both printer driver diskettes and you may need to flip-flop between them.

**PRINTER: PSCRIPT.IBM 4019 v52\_1(39 Fonts)**  
**DISKETTE PATH** \_\_\_\_\_

- \_\_\_\_ 1. Open an icon view of the required printer driver **diskette 1** (image).
- \_\_\_\_ 2. Open the **PSCRIPT.DR\_** folder. This folder contains all PostScript drivers shipped with OS/2. **Hint:** Use the **P** key to move through the icons whose titles start with P.
- \_\_\_\_ 3. Scroll and locate the required printer driver, **PSCRIPT.IBM 4019 V52\_1 (39 Fonts)**.
- \_\_\_\_ 4. Drag the printer driver to the desktop. This drag and drop creates a new printer object on the desktop and assigns it to the next available port.
- \_\_\_\_ 5. When prompted to install the WIN-OS/2 driver equivalent, say **Yes**.
- \_\_\_\_ 6. If using the LAN, the system specifies the required diskette (path). Press **OK**. Follow directions. You will be prompted for additional diskettes.
- \_\_\_\_ 7. There will be no completion message. You will need to watch the activity light on the disk drive. When the installation completes, close open windows and locate the new printer object.
- \_\_\_\_ 8. Open the **Settings** notebook; tab to the **Output** page. Note that LPT2 has been assigned to this printer.
- \_\_\_\_ 9. Rename the object **Postscript**.
  - Change the name field on the General tab of the settings notebook OR use direct manipulation.

Create another print object. This printer will use the same physical device as the PostScript printer you have just installed on LPT2, but will not use PostScript mode.

**PRINTER:** IBM4019 Laser Printer E (IBM4019.DRV)

**DISKETTE PATH:** \_\_\_\_\_

- \_\_\_ 1. Use a template to create a new printer object named **Laser Printer**.
  - Open the **Templates** folder; drag a **Printer** template to the desktop.
  - Change the **Name** field to **Laser Printer**.
- \_\_\_ 2. Select the **LPT2** port object in the **Output port** window.
- \_\_\_ 3. Select **Install new printer driver....**
- \_\_\_ 4. Verify the **Printer driver shipped with OS/2** is selected in the Printer Driver selection box at the top of the panel.
- \_\_\_ 5. Scroll and select the required OS/2 driver, **IBM4019 LaserPrinter E (IBM 4019.DRV)**, and press **Install**.
- \_\_\_ 6. If using the LAN, the correct directory is determined by the system. Press **OK**.
- \_\_\_ 7. Press **OK** when installation of the driver completes.
- \_\_\_ 8. Press **Create** to complete the definition of the printer object.
- \_\_\_ 9. When you are prompted to install the equivalent WIN-OS/2 printer, answer **Yes**.
- \_\_\_ 10. Accept the path if using the LAN. Change the directory if required when prompted for the printer driver diskettes. Note: You may have to flip-flop between diskettes (images).

When the installation completes, your new printer object will be on the desktop.

## **Exercise 5.2 Working with Printers**

### **What This Exercise is About**

You have installed printer objects on the desktop. In this exercise, you will explore how printers are used.

### **What You Should Be Able To Do**

Upon completion of this exercise, you will be able to:

- Modify printer settings.
- Modify and manipulate job queues.

## Exercise Instructions

**Modify the printer settings for the new printer object, Laser printer.**

- \_\_\_\_ 1. Change default view of the **Laser Printer** to a **Details** view.
  - Open the **Settings** notebook for the Laser Printer object.
  - On the **View** page, change the default view to **Details**.
- \_\_\_\_ 2. Change the paper orientation to **Landscape**.
  - Turn to the **Printer Driver** tab. Press the **Job Properties** pushbutton.

**Note:** The Job Properties window is unique for each printer driver. All options shown may not be available for all printer drivers. Press the **Help** pushbutton to learn about other job properties for your printer driver.
  - Press the **Landscape** radio button to change the paper orientation for all jobs sent to this printer object. Press the **OK** pushbutton to confirm the change.
  - Close the Settings notebook.

**Explore job and queue options.**

- \_\_\_\_ 1. Set the status of all printer queues to **Hold**.
  - Display the pop-up menu for the **Laser Printer** object and select **Change Status**.
  - Select **Hold**.
  - Repeat for the **PostScript** printer and the **IBMNUL** Printer.
- \_\_\_\_ 2. Make **Laser Printer...** the default printer. The system will route a print job to the default printer if no other printer is selected. Exceptions: The Print command, entered from a command prompt sends output to LPT1 by default, unless directed to a different port using the Device parameter.
  - Display the pop-up menu for the **Laser Printer** printer object.
  - Select **Set Default**.

- Select **Laser Printer**.

\_\_\_ 3. View the contents of the **Laser Printer** queue.

To view the contents of the queue assigned to **Laser Printer**, double-click the printer icon. The Job Details View for the printer is displayed. It is currently empty.

\_\_\_ 4. Print **C:\AUTOEXEC.BAT** by opening Drive **C**, selecting **AUTOEXEC.BAT**, and dragging it to the printer. Select **Plain text** for the type of data.

\_\_\_ 5. Print using the **Print Screen** keystroke.

\_\_\_ 6. Verify the two jobs are in the Laser printer queue.

\_\_\_ 7. Display the pop-up menu for the second job and note options available.

**Note:** The job shown in the Job Details View window is an object, just like other objects in the Workplace Shell, and can be manipulated. You may perform a number of tasks from the job's pop-up menu:

<b>Copy</b>	allows you to make an additional copy of the selected job.
<b>Delete</b>	cancels the selected job.
<b>Change status</b>	allows you to hold (pause) a print job, or release a job which is currently held.
<b>Print next</b>	causes a particular job to print before any other pending job.

\_\_\_ 8. Select **Print next** and observe the result.

\_\_\_ 9. Verify a print command goes to LPT1, if no other port is specified. Print **CONFIG.SYS** from an OS/2 command prompt.

- Open an OS/2 command prompt.
- Enter the OS/2 command:  
**PRINT CONFIG.SYS.**
- Open the IBMNULL printer. Is your CONFIG.SYS print job in the queue? YES
- Display the job pop-up menu and select **Delete**.

\_\_\_ 10. **Delete** all jobs in the printer queues and close all printer windows.

## **Optional Exercise 5.3 WIN-OS/2 Printing and the Print Manager**

### **What This Exercise is About**

Generally, you should use the printer objects on the OS/2 desktop to manage your print jobs. However, you may have customers who do not want to go to the OS/2 desktop to see their print jobs. For a given port, if there is a printer object on the desktop, jobs sent to that port from the WIN-OS/2 environment will not appear in the WIN-OS/2 Print Manager. In general, if you have no corresponding printer on the port, the WIN-OS/2 print jobs will be managed by the Print Manager.

You installed printers on LPT2 in Exercise 5.1, and their corresponding WIN-OS/2 printer drivers were installed. In this exercise you will install WIN-OS/2 printer drivers, using the WIN-OS/2 Print Manager. Although OS/2 has a wide variety of printer drivers for use with WIN-OS/2, there may be times when you have already installed just the OS/2 driver, but not its WIN-OS/2 equivalent, or when you do not have an OS/2 driver.

In this exercise, you will work with the WIN-OS/2 Print Manager.

### **What You Should Be Able To Do**

Upon completion of this exercise, you will be able to:

- Install a WIN-OS/2 printer.
- Use and configure the WIN-OS/2 Print Manager.

## Exercise Instructions

Install a WIN-OS/2 printer driver.

**WIN-OS/2 printer:** IBM Proprinter XLII  
**Directory:** \_\_\_\_\_

**Optional printer:** \_\_\_\_\_  
**Directory:** \_\_\_\_\_

- \_\_\_\_ 1. Start the **WIN-OS/2 Full Screen command prompt**. Open the **Control Panel**.
  - Start a **WIN-OS/2 full-screen** session (inside the Command Prompts folder).
  - Open the **Control Panel**.
- \_\_\_\_ 2. Open **Printers**.
- \_\_\_\_ 3. Note that the printers installed previously are available for use in the WIN-OS/2 environment.
- \_\_\_\_ 4. Press the **Add>>** pushbutton to display the **List of Printers** listbox.
- \_\_\_\_ 5. Use the scroll bar to display the required printer driver. Select the driver and press the **Install** pushbutton.
- \_\_\_\_ 6. Note WIN-OS/2 does not create the diskette path for the LAN. Change the drive and directory to the appropriate path and press the **OK** pushbutton.  
Tip: If you are on the LAN, use the Browse to enter the path. You may need to enter a second diskette (path).
- \_\_\_\_ 7. Assign the **LPT1.OS2** port to the new printer.
  - Select the printer in the **Installed Printers** list and press the **Connect...** pushbutton.
  - Select **LPT1.OS2** in the Ports listbox. Press the **OK** pushbutton.  
**Note:** Try to keep drivers in the OS/2 and WIN-OS/2 environment in matching pairs. If there is no equivalent OS/2 driver, create another printer on the desktop, using **IBMNUL** for the printer driver, and assign to **LPT2**. In this case, the **IBMNUL** driver is already on **LPT1**.
  - Print job defaults may be modified by selecting the printer and pressing the **Setup...** pushbutton.



- \_\_\_ 8. Make the new printer the default printer.
- Select the newly installed printer in the Installed Printers listbox.
  - Press the **Set as Default Printer** button.

**Print using the WIN-OS/2 printer.**

- \_\_\_ 1. Turn on the **Print Manager**.
- Check the **Use Print Manager** checkbox.
  - Verify the **Proprinter** or your attached printer is the **Default Printer**.
  - Close the **Printers** window and the **Control Panel**.
- \_\_\_ 3. Start the **Print Manager** in the **WIN-OS/2 Main** group.
- \_\_\_ 4. **Pause** all printers. Minimize the Print Manager.
- \_\_\_ 5. Start **Notepad** in the **WIN-OS/2 Accessories** group.
- \_\_\_ 6. Enter some keystrokes and print the data.
- Type your name. Select **File**.
  - Select **Print Setup** and verify that the default printer is your printer on LPT1. Press **OK**.
  - Select **File** and **Print**. Does the job appear in the Print Manager? It will not appear even though the Print Manager is checked because there is a corresponding OS/2 port.
- \_\_\_ 7. Return to the **OS/2 desktop** and open the **IBMNUL** printer. Note that your job has been sent to the OS/2 print system. Delete the job.
- \_\_\_ 8. Delete the **IBMNUL** printer.
- \_\_\_ 9. Return to **WIN-OS/2** and print the **Notepad** file again.
- Is your print job in the WIN-OS/2 Print Manager queue? YES

- \_\_\_10. Delete all jobs in the Print Manager.
- Select the **Notepad (untitled)** item and press **Delete**.
- \_\_\_11. Close all open windows and close the WIN-OS/2 Program Manager.



## Unit 6. Fonts

### What This Unit is About

Adobe Type Manager (ATM) is included with OS/2 2.1 and ATM fonts are handled automatically for OS/2 applications. You can install additional ATM fonts using the Font Palette. OS/2 2.1 includes the Adobe Type Manager for WIN-OS/2 so that your Windows programs can use the same fonts as your OS/2 programs. In this unit you will install and work with fonts on both the OS/2 and WIN-OS/2 desktops.

### What You Should be Able to Do

After completing this unit, you should be able to:

- Describe font support provided in OS/2 2.1.
- Install fonts for use in the OS/2 and Win-OS/2 environment.

### How You Will Check Your Progress

- Apply skills in exercises

### References

*OS/2 2.1 Using the Operating System* (S61G-0703-00)

- Chapter 4, System Settings
- Chapter 19, Adobe Type Manager for WIN-OS/2

## Fonts Shipped with OS/2

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- Helvetica - Normal, *Italic*, Bold  
*Bold Italic*
- Times New Roman - Normal, *Italic*,  
Bold, *Bold Italic*
- Courier - Normal, *Italic*, Bold, *Bold Italic*
- Symbol - αβχδεφγη
- Additional Fonts Available

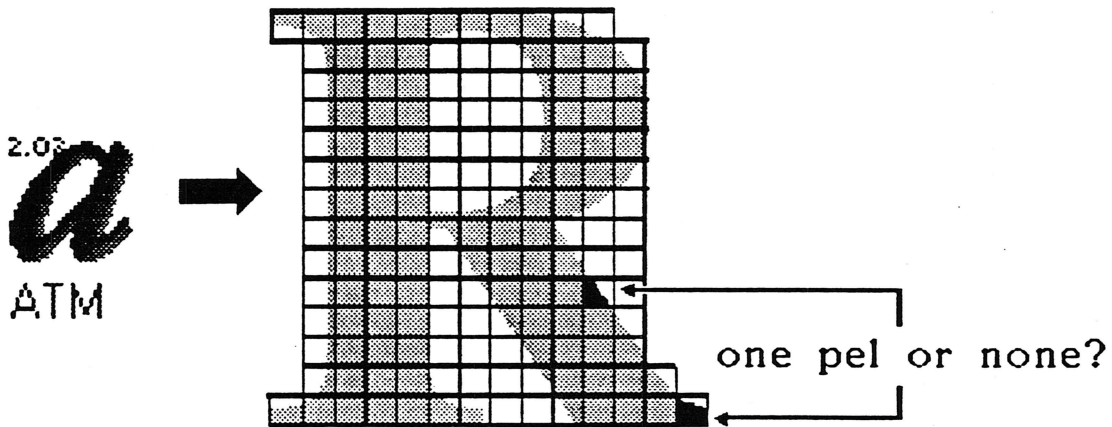
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P73F0010

### Notes:

The IBM Core Fonts consist of a set of thirteen Adobe Type 1 fonts that work with the Adobe Type Manager (ATM). These fonts are copied to your hard disk during installation unless you specify otherwise.

# Adobe Type Manager



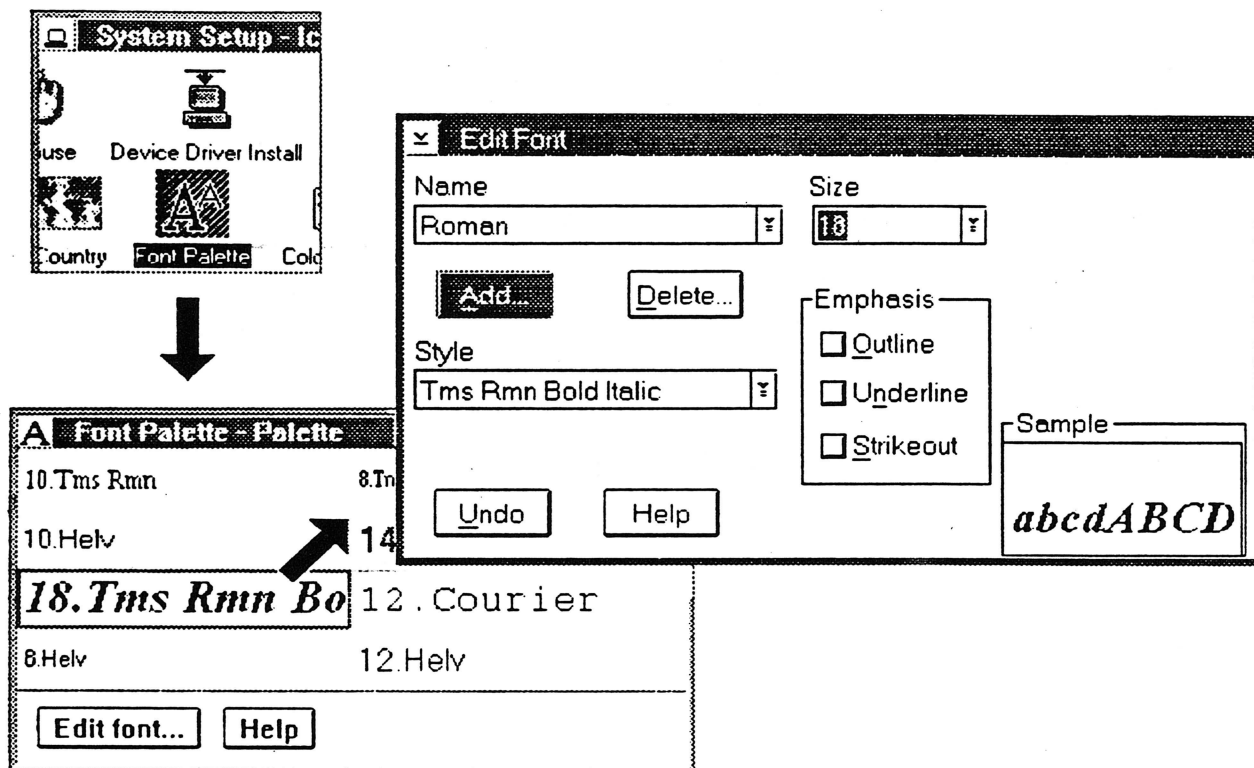
P71F0020

**Notes:**

The Adobe Type Manager (ATM) is an integral part of the OS/2 2.1 operating system and works with existing OS/2 and WIN-OS/2 application programs to produce the sharpest possible fonts on the screen and on the printed page.

The fonts supplied are Type-1 fonts which are rasterized by ATM. This means they give the output device information on how to draw the character. This is useful because it makes the characters easily scalable. Instead of having different character definitions for each point size, the basic definition remains unchanged and the information is scaled to produce the desired size.

## Adding OS/2 Fonts



P71F0030

### Notes:

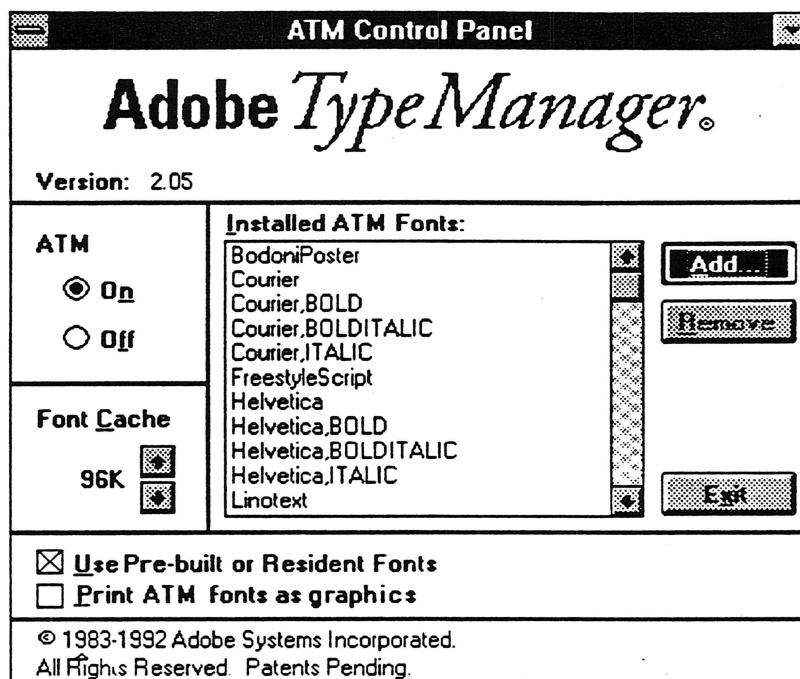
The Font Palette allows you to select display fonts for system objects. If you want a font that is not installed or available on the palette use the **Edit Font...** button. To add a new font, select one of the fonts shown on Edit font.... You can change the font (the **Name** field), or the font's style, size or emphasis. If you want a base font that is not on your system, select the **Add...** pushbutton, insert the diskette containing the appropriate font, and select the font you want.

If you want more than eight fonts available from the desktop, you can create additional font palettes, using the Font Palette template in the Templates folder.

# Adding WIN-OS/2 Fonts

ATM Control Panel  
ATMCTRL.EXE

2.05  
*a*  
→  
ATM Control Panel



P71F0040

## Notes:

Windows 3.1 includes TrueType\*\* font support. TrueType is an advanced font technology - similar in concept to ATM - which enables scalable fonts to be accurately displayed and printed.

WIN-OS/2 3.1 includes both TrueType and ATM font technologies. TrueType is installed by default and can be selected using the WIN-OS2 Control Panel - Fonts icon. However, since ATM is also implemented in OS/2, it is recommended that ATM be used in preference to TrueType since this simplifies moving documents and clipboard data between WIN-OS/2 and Presentation Manager.

The thirteen IBM Core Fonts installed are also available for use in WIN-OS/2, but they are not installed at installation time. They must be installed using the WIN-OS/2 ATM Control Panel.

The ATM Control Panel is used to add and remove ATM fonts, change the font cache size, use pre-built or resident font software, and turn the ATM program on or off. When you change any of the choices in the ATM Control Panel, except the **Use Pre-built or Resident Fonts** choice, you must exit and then restart your WIN-OS/2 session for your changes to take effect.



## Exercise 6.1 Installing OS/2 and WIN-OS/2 Fonts

### What This Exercise is About

Although OS/2 fonts can be installed during installation, you may not have installed all needed fonts or may subsequently purchase additional ones. In this exercise you will install a new font needed by an OS/2 application. You will also enable the use of ATM fonts in WIN-OS/2.

### What You Should Be Able to Do

At the end of this lab, you should be able to:

- Add new fonts to be used by OS/2 applications.
- Add fonts to be used by a Windows application.

## Exercise Instructions

### Install additional OS/2 fonts.

Fonts available in the public domain are located in the FONTS folder on your student diskette.

- \_\_\_\_ 1. Insert **Student Diskette** in Drive A. Open Drive A and drag **FONTS** to Drive D.
- \_\_\_\_ 2. Open the **Font Palette**. Press **Edit Font...** button.
  - Display the **Desktop** pop-up menu, select **System Setup**, and **Font Palette**.
  - Press the **Edit font...** button.
- \_\_\_\_ 3. Press the **Add...** button in the dialog box.
- \_\_\_\_ 4. Change the **A:\** to **D:\FONTS** and press **Add**.
- \_\_\_\_ 5. Select a few fonts in the **Font File** window. Press the **Add** button.
- \_\_\_\_ 6. Note that if you try to select one of the new fonts in the Edit Font window, it does not appear to be available. You must close the **Edit font** window and then open it again to update the font list.
- \_\_\_\_ 7. Try some of the new fonts.
  - Display the drop-down menu on the **Name** box and select a new font.
  - Close the **Edit font** window.
  - The new font is now available in the Font Palette.
  - Use the right mouse button to drag and drop the new font.
- \_\_\_\_ 8. Close all open windows.

## Install a Type-1 font for the WIN-OS/2 environment.

ATM fonts for WIN-OS/2 shipped with OS/2 are installed in C:\PSFONTS\PFM. Additional fonts installed in the preceeding activity are in D:\FONTS.

- \_\_\_\_ 1. Start a full-screen WIN-OS/2 session.
  - Open the **Command Prompts** folder and start a WIN-OS/2 **Full-Screen** session
- \_\_\_\_ 2. Start the **ATM Control Panel**.
  - Open the **ATM Control Panel** (inside the WIN-OS/2 Main Group).
- \_\_\_\_ 3. Add a font of your choice.
  - Press the **Add...** pushbutton. The Add ATM Fonts window is displayed.
  - Use the **Directories** listbox to build the Source Directory path for either C:\PSFONTS\PFM or D:\FONTS.
  - The available fonts are displayed in the Available Fonts listbox.
  - Select any entry in the Available Fonts listbox.
  - Press the **Add** pushbutton.
- \_\_\_\_ 4. Activate ATM.
  - Verify that ATM has been turned on. Press the **On** radio button to activate ATM.
- \_\_\_\_ 5. Press the **Exit** pushbutton to close the Add ATM Fonts window.

**Tip:** If installing a sans-serif (block-ended) font, only install the plain version of the font (do not install bold, italic versions). This saves disk space. ATM uses the plain version to create the bold and italic fonts.
- \_\_\_\_ 6. As desired, you may start the WIN-OS/2 applet, WRITE, which uses fonts. The Character choice on the action bar is used to change fonts.
- \_\_\_\_ 7. Close the WIN-OS/2 session by closing the **Program Manager**.

# Unit 7. Control Files

## What This Unit is About

There are several key files which control OS/2 system configuration. This unit will focus on these files and how they are used and managed. In addition, this unit addresses command files available in OS/2.

## What You Should be Able to Do

After completing this unit, you should be able to:

- Describe the content and uses of \*.INI files.
- Rebuild or restore \*.INI files if they become corrupted.
- Backup \*.INI files to save customer's customization information.
- Describe the function of CONFIG.SYS.
- Configure the swap file to support a customer's memory requirement.
- Ensure data and programs can be located when accessed.
- Configure file system parameters.
- Modify STARTUP.CMD or the Startup folder to initialize the system to meet a user requirement.

## How You Will Check Your Progress

- Apply skills in exercises

## References

- Online Command Reference

---

## OS/2 \*.INI Files

---

OS/2 unleashed - INT Utility

### OS2SYS.INI and OS2.INI

- Use their own data structure
- Cannot be edited by ordinary text editor
- System components in OS2SYS.INI
- User components in OS2.INI
- Backups are highly recommended
- MAKEINI is used to restore/customize original \*.INIs

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#### Notes:

The OS2SYS.INI file contains system defaults for the Workplace Shell. It contains information about objects such as communications ports, printers, displays, memory, the spooler and window characteristics.

The OS2.INI file contains user information about currently running program objects; shadowed/copied objects; program reference objects; palette objects; disk objects; folder positions; and program associations and types.

REXX and C programs can be used to change Workplace Shell defaults by:

- Preventing program restart at IPL;
- Limiting users access to settings;
- Creating and populating folders;
- Adding new file types; and
- Removing WPS Objects.

To see examples, see chapter 6, Installing and Supporting WPS, Redbook: *OS/2 V2.0 Vol. 3: Presentation Manager and Workplace Shell* (52G9940).

---

## Rebuilding OS2.INI and OS2SYS.INI

---

- Restore from OS2\INSTALL at system boot
- MAKEINI
- Backup \*.INI files

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**Notes:**

INI file corruption will result in a loss of information used to build the OS/2 desktop. Here are three ways to recover from file corruption.

1. Try this fix first if your \*.INI files are corrupted. Press and hold the Alt + F1 keys for about 15-20 seconds during boot (when the black screen with the OS/2 logos appears) to bypass using \CONFIG.SYS, \OS2\OS2.INI, and \OS2\OS2SYS.INI. These files will be renamed and replaced with files in the \OS2\INSTALL subdirectory. The user receives a message and the system continues the boot process.
2. The MAKEINI command will build usable \*.INI files, but all customization data will not be restored. To do MAKEINI, boot the OS/2 installation diskette and insert diskette 1 when prompted. When prompted to continue or escape, <esc> to an OS/2 command prompt. Go to the OS2 directory.  
Type:           **MAKEINI OS2.INI INI.RC**  
                  or  
                  **MAKEINI OS2SYS.INI INISYS.RC**  
When the command completes, boot the system. It may take several minutes to build the \*.INI files.
3. The best way to preserve customization data is to back up the \*.INI files. Statements to save \*.INI data can be put in the STARTUP.CMD batch file which is always run at system boot time.

# Checkpoint

Fill in the appropriate file names to build backup copies of your \*.INI files.

When this sequence of commands is executed four times, you will have a history of your \*.INI file values. This technique is sometimes called "grandfathering."

REM \*\*\*Build Backup History of INI Files \*\*\*

C:

XCOPY C:\OS2\INSTALL\OS2.3 C:\OS2\INSTALL\OS2.4

XCOPY C:\OS2\INSTALL\OS2.\_\_\_\_ C:\OS2\INSTALL\OS2.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2.\_\_\_\_ C:\OS2\INSTALL\OS2.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2.INI C:\OS2\INSTALL\OS2.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2SYS.\_\_\_\_ C:\OS2\INSTALL\OS2SYS.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2SYS.\_\_\_\_ C:\OS2\INSTALL\OS2SYS.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2SYS.\_\_\_\_ C:\OS2\INSTALL\OS2SYS.\_\_\_\_

XCOPY C:\OS2\INSTALL\OS2SYS.INI C:\OS2\INSTALL\OS2SYS.\_\_\_\_

CD\

REM \*\*\* You did it ... \*\*\*

**Note:** These statements can be executed in the OS/2 STARTUP.CMD file or be put in a \*.CMD file and placed in the Startup folder.

---

## CONFIG.SYS

---

- Read each time OS/2 is initialized
- Customizes the OS/2 system
- Contains system control information:
  - system options
  - device information
  - initialization programs
- Associated to OS/2 System Editor

---

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### Notes:

When you boot your system, your CONFIG.SYS file is "executed" and your system options and device configurations are set.

CONFIG.SYS is always located in the root directory of the OS/2 boot drive. It is associated to the OS/2 System Editor, so double-clicking the CONFIG.SYS icon will open the editor with CONFIG.SYS. You may then edit the file and save it.

If you change CONFIG.SYS, the changes will not be applied until the system is shut down and restarted.



---

## CONFIG.SYS Management

---

- Memory management
- Program management
- Interprocess communications
- User interface management
- File management
- Task management

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---

### Notes:

Some examples:

Memory management	MEMMAN SWAPPATH
Program management	LIBPATH PATH DPATH
Interprocess communications	BREAK
User interface management	SET PROTSHELL RUNWORKPLACE
File management	DEVICE,IFS DISKCACHE
Taskmanagement	THREADS TIMESLICE MAXWAIT

## Memory Management

---

- SWAPPATH=  
C:\OS2\SYSTEM MINFREE INITIAL
- MEMMAN=COMMIT → Ar OS/2 1.3

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### Notes:

SWAPPATH=C:\OS2\SYSTEM 4096 2048 -- 4096 is the amount of free space remaining on the drive which triggers a warning; 2048 is the initial space allocated at system startup.

When a space warning is issued, you should return to the desktop and close any applications not needed. If you ignore the warning and do not free up space, your system may lock up and data may be lost.

OS/2 allocates space to the swap file, and if more is needed, the file will grow dynamically. OS/2 will try to shrink the file back to the original size. Therefore, the second parameter on the SWAPPATH statement should be set to the amount of space your system uses to normal operation. This will reduce overhead to grow and shrink the file and reduce disk fragmentation.

Use the COMMIT only if you need it for specific 16-bit OS/2 applications. COMMIT reserves in the swap file total space requested by the application before the application is loaded. If the space is not available, the application will not load.

## Program Management

- SET PATH =  
C:\OS2;C:\OS2\SYSTEM; . . .
- SET DPATH =  
C:\OS2;C:\OS2\SYSTEM; . . .
- LIBPATH =  
C:\OS2\DLL; . . .

*→ applicable*  
*OS2\DLL should be first in LIBPATH*

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### Notes:

PATH and DPATH are environment variables, placed there with the SET command. Environment is an area set aside which can be accessed by any program. The system or programs look for locations of data and executables as directed in the DPATH or PATH statements.

Dynamic Link Libraries (DLLs) are program segments that are shared globally by applications. The LIBPATH command defines a global path for DLLs rather than doing the search on a process basis, accessing the environment variable. Unlike PATH and DPATH locations, the system does not search the current directory for a DLL. The "." provides this function.

## File Management

- DISKCACHE =

64,4,LW,AC:C

↓  
-cache size  
-see chart.

↓  
minimum before  
caching takes place

↓ list of drives against which CHMPS is run.

- IFS =

C:\OS2\HPFS.IFS /CACHE:128  
/CRECL:4 /AUTOCHECK:C

*Remove this  
line if HPFS  
not used.  
Wastes memory*

↓  
max. size  
for caching

↓  
in 2K blocks.

*512 byte  
blocks*

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### Notes:

Although installation defaults might not be customized to a particular system, it is beneficial to have access to larger cache sizes. Install OS/2 with larger cache sizes when additional memory is available. Conversely, reduce cache size if there is less memory available. The default values are shown in the table below. If **only** the FAT file system is installed, the default sizes are for the DISKCACHE= statement in the CONFIG.SYS file. If system partitions are **all** HPFS, the default size is for the IFS=HPFS statement in the CONFIG.SYS file. If the system uses both file system types, OS/2 installation changes the cache size for both file systems. The file system with the largest total amount of DASD (sum of the partitions) gets the larger default value as shown.

<u>Memory Size in MB</u>	<u>Two File Systems</u>	<u>One File System</u>
4 or 5	128/64	128
6	256/64	256
7	256/128	256
8 or 9	256/256	384
10 through 16	512/512	1024
17 through 32	1024/1024	2048

## Building CONFIG.SYS

---

### During installation

- Modify selected parameters
- Migrate existing information
  - Statements automatically updated for OS/2 2.1
  - Incompatible statements 'REMed' out
  - Final file can be reviewed and edited during install

### Post installation

- Minor changes

---

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### Notes:

Parameters which can be modified during installation are FILES, IOPL, MEMMAN, SWAPPATH, BUFFERS, MAXWAIT, THREADS, PRIORITY, and DISKCACHE.

## Checkpoint (Optional)

Match the following CONFIG.SYS function to the appropriate statement number below. Use the Online Command Reference or Appendix H if you need help.

Command Process file paths \_\_\_\_\_

System environment options: \_\_\_\_\_

- Autostart \_\_\_\_\_

- Prompts \_\_\_\_\_

Set up path defaults for: \_\_\_\_\_

- Dynamic Link Libraries \_\_\_\_\_

- Subdirectories \_\_\_\_\_

- Help files \_\_\_\_\_

- Glossaries \_\_\_\_\_

- Reference Materials \_\_\_\_\_

- User & System INI files \_\_\_\_\_

- Command Retrieval \_\_\_\_\_

Set up devices for a: \_\_\_\_\_

- Communication port \_\_\_\_\_

- DASD \_\_\_\_\_

- Diskette or hard drive \_\_\_\_\_

- Display \_\_\_\_\_

- Keyboard \_\_\_\_\_

- Pointing device \_\_\_\_\_

- Printer \_\_\_\_\_

1. SET USER\_INI=C:\OS2\OS2.INI
2. SET SYSTEM\_INI=C:\OS2\OS2SYS.INI
3. SET OS2\_SHELL=C:\OS2\CMD.EXE
4. SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS
5. SET RUNWORKPLACE=C:\OS2\PMSHELL.EXE
6. SET COMSPEC=C:\OS2\CMD.EXE
7. SET PATH=C:\OS2;\OS2\SYSTEM;\C:\OS2\MDOS\WINOS2;\C:\OS2\INSTALL;\C:\;..
8. SET DPATH=C:\OS2;\OS2\SYSTEM;\C:\OS2\MDOS\WINOS2;\C:\OS2\INSTALL;\C:\;..
9. SET PROMPT=\$i\$P
10. SET HELP=C:\OS2\HELP;\OS2\HELP\TUTORIAL;
11. SET GLOSSARY=C:\OS2\HELP\GLOSS;
12. LIBPATH=.;D:\OS2\DLL;D:\OS2\MDOS;D:\;D:\OS2\APPS\DLL;
13. SET KEYS=ON
14. SET DELDIR=C:\DELETE,512;D:\DELETE,512,E:\DELETE,512;
15. SET BOOKSHELF=C:\OS2\BOOK;
16. SET EPMPATH=C:\OS2\APPS;
17. BASEDEV=OS2DASD.DMD
18. DEVICE=D:\OS2\COM.SYS
19. BASEDEV=IBM1FLPY.ADD
20. SET VIO\_VGA=DEVICE(BVHVGA)
21. DEVINFO=KBD,US,D:\OS2\KEYBOARD.DCP
22. DEVICE=D:\OS2\POINTDD.SYS
23. DEVICE=D:\OS2\MOUSE.SYS
24. DEVICE=D:\OS2\PRINTER4.SYS
25. DEVINFO=SCR,VGA,D:\OS2\VIOTBL.DCP
26. SET VIDEO\_DEVICES=VIO\_VGA
27. CODEPAGE=437,850

## STARTUP.CMD

---

- Batch file invoked at system startup
  - Can contain OS/2 Base, ES, LS, DOS and REXX statements
- Starts OS/2, DOS and Windows applications
- Multiple applications can be started
- Invoked while the Workplace Shell is initialized
  - CONFIG.SYS => STARTUP.CMD => WPS

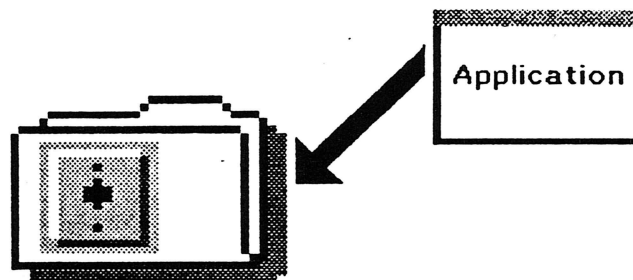
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### Notes:

## Startup Folder

---



- Workplace Shell equivalent of `STARTUP.CMD`
- Program objects in folder started automatically
- Order of startup not controllable
- Invoked DURING Workplace Shell initialization

`CONFIG.SYS=>STARTUP.CMD=>WPS=>STARTUP FOLDER`

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### Notes:

The STARTUP folder keeps a user from having to write a `STARTUP.CMD` file or other batch files.

Shadows or program reference objects can be dragged and dropped into the STARTUP folder.

To permanently suppress the startup of programs running at system shut down, insert `SET RESTARTOBJECTS=STARTUPFOLDERS ONLY` in your `CONFIG.SYS`.

### Limitations:

- No conditional start of programs (as with REXX `STARTUP.CMD` file).
- Programs start after WPS is fully loaded (`STARTUP.CMD` begins earlier).
- No control of the order in which applications are started.

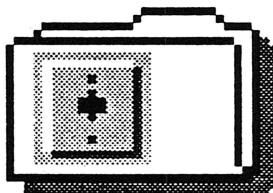


## Summary

CONFIG.SYS



STARTUP.CMD



Workplace  
Shell  
Initialization

Startup  
folder

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### Notes:

When starting dependent applications at system boot, the order is very important. Note that AUTOEXEC.BAT is provided for DOS compatibility and is executed each time a DOS application is started.

## Exercise 7.1 Working with OS/2 Control Files

### What This Exercise is About

This exercise will give you practice in applying your knowledge of control files and in changing OS/2 control files.

### What You Should Be Able To Do

At the end of this exercise you should be able to:

- Use online help to make a change to CONFIG.SYS.
- Modify the CONFIG.SYS file to customize the system to meet a user requirement.
- Create a STARTUP.CMD to back up the CONFIG.SYS file.
- Use the Startup Folder to launch an application during OS/2 initialization.

## Exercise Instructions

Create a **STARTUP.CMD** file to back up your **CONFIG.SYS** file three times.

- \_\_\_\_ 1. Start the OS/2 System Editor and create a file. Enter statements to copy the **CONFIG.SYS** file at boot time and make three backups.

Refer to the Checkpoint exercise (page 7-4). Hint: One of your statements might look like this:

**XCOPY C:\CONFIG.SYS C:\CONFIG.1**

- \_\_\_\_ 2. Save the file as **STARTUP.CMD** on the **root of Drive C**.
- \_\_\_\_ 3. Run **STARTUP.CMD** by double-clicking it. The first time the file executes, you will be prompted by **XCOPY** whether the target for the copy is a file or directory. The command will have to run three times to build a history.

**Modify the CONFIG.SYS to enable the UNDELETE function.**

- \_\_\_\_ 1. Use the Command Reference to look up the **UNDELETE** command. What statement is modified in the **CONFIG.SYS**? \_\_\_\_\_
- \_\_\_\_ 2. Modify the **CONFIG.SYS** to enable the **UNDELETE** command on **Drive D**.
- \_\_\_\_ 3. Shut down your system.
- \_\_\_\_ 4. Reboot and delete a file in the **D:\FONTS** folder.
- \_\_\_\_ 5. At an OS/2 command prompt, enter **UNDELETE /S**. When prompted to recover your file, enter **Y** (yes).
- Enter **HELP UNDELETE** if you need more assistance.

## Unit 8. Application Support

### What This Unit is About

The ability to run DOS, Windows, and OS/2 applications on the same desktop is one of the major benefits of OS/2. In this unit, you will learn how OS/2 implements support for DOS and Windows applications and how to make these applications run as well or better than in native DOS or Windows environments.

### What You Should Be Able To Do

After completing this unit, you should be able to:

- Describe DOS and Windows application support provided by OS/2 2.1.
- Describe how OS/2 provides uniquely customized application environments.
- Identify and recommend appropriate actions when an application does not execute to user satisfaction on OS/2 2.1.
- Given a customer requirement, install applications and use application settings to customize how applications execute.
- Describe interprocess communication provided to applications.
- Configure the desktop to run Windows applications as best suits a customer need.
- Create a migration database to support a customer's unique application portfolio.

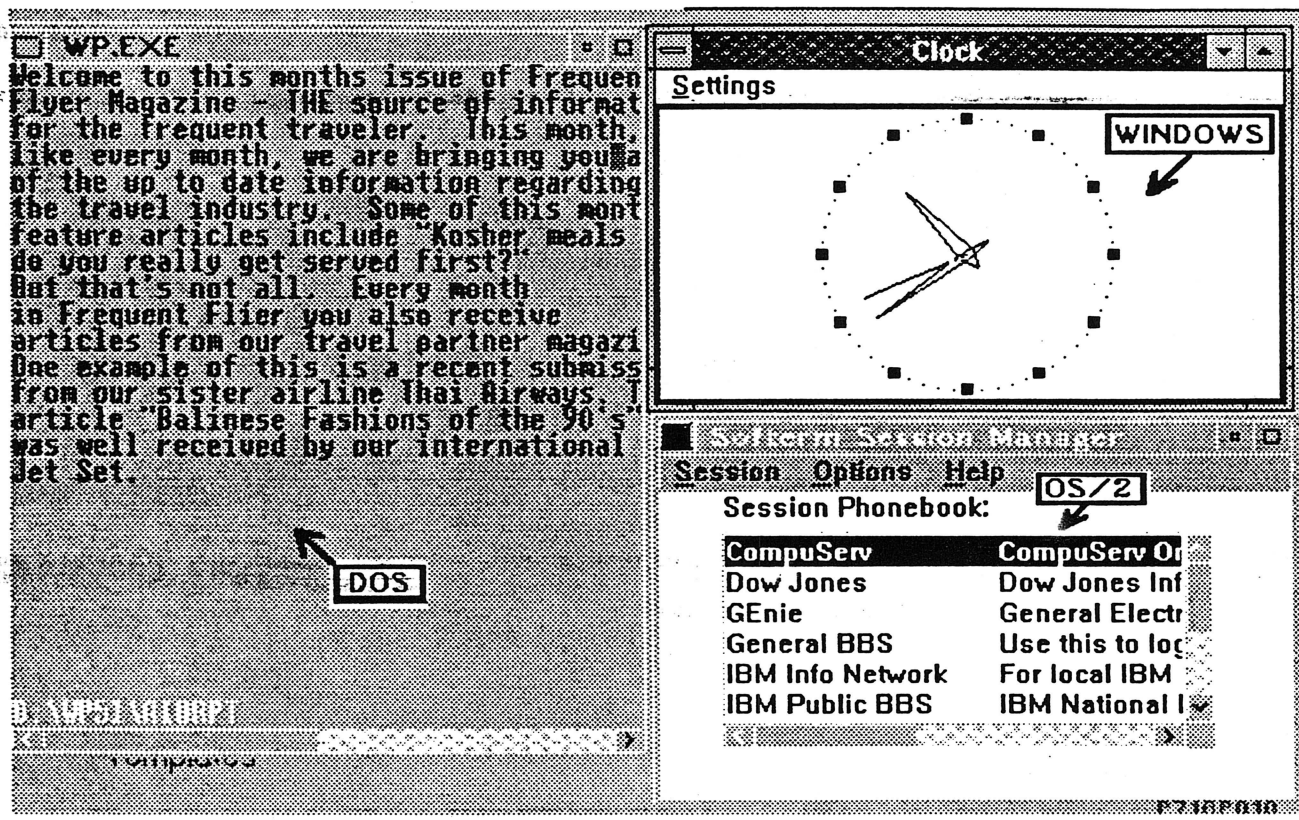
### How You Will Check Your Progress

- Practice skills in exercises
- Checkpoints

### References

- *OS/2 2.1 Using the Operating System*, S61G-0703-00, especially Chapter 17 - Preparing Your Program and Chapter 26 - Software Support
- *OS/2 Version 2.0 Volume 2: DOS and Windows Environment*, GG24-3731-00

# Applications Supported



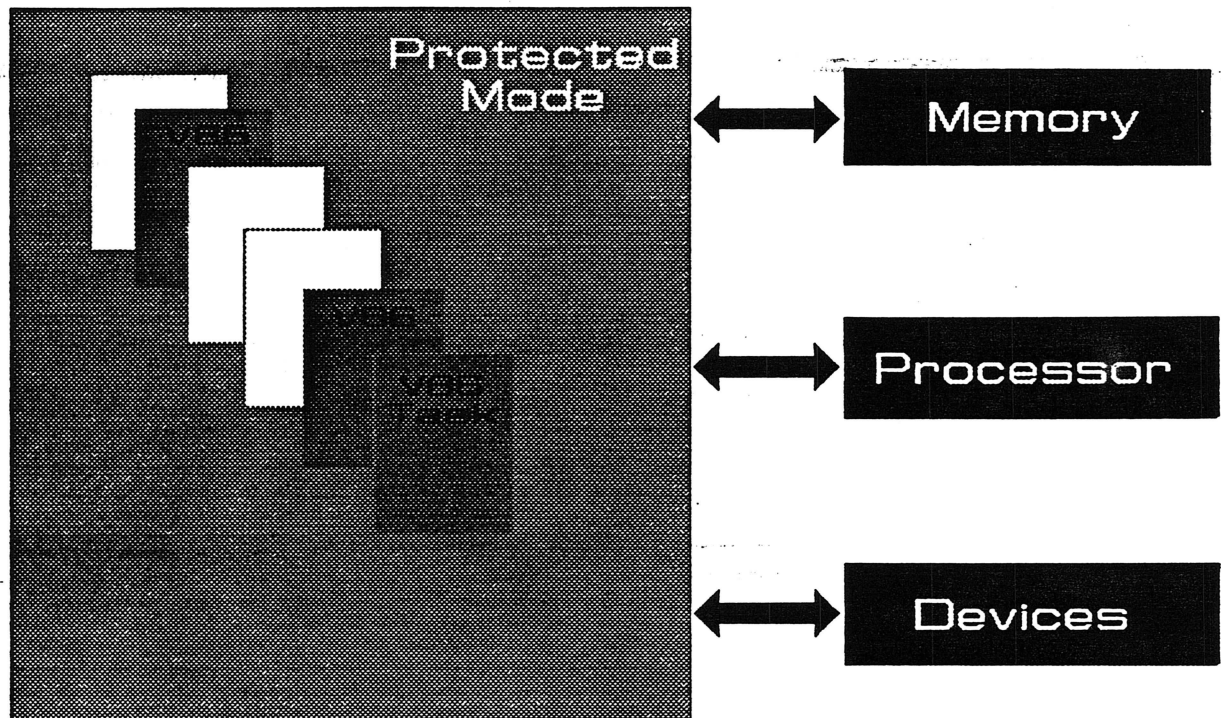
## Notes:

OS/2 2.1 provides the user with the ability to run multiple, concurrent DOS applications including Windows applications. This function is provided by the Multiple Virtual DOS Machines (MVDM) architecture. DOS and Windows applications are multitasked with OS/2 applications.

DOS applications can:

- Run full-screen or in a window.
- Run in a background session without being suspended.
- Use the clipboard.
  - Copy text.
  - Copy graphics as bitmaps.
- Run graphics in full-screen and windowed mode.
- Use LIM EMS Version 4.0 expanded memory services.
- Use LIMA XMS Version 2.0 extended memory services.
- Use the dual thread feature to improve execution (for multimedia applications).
- Use tailored AUTOEXEC.BAT files.

## Virtual 8086 Tasks



P71AP020

### Notes:

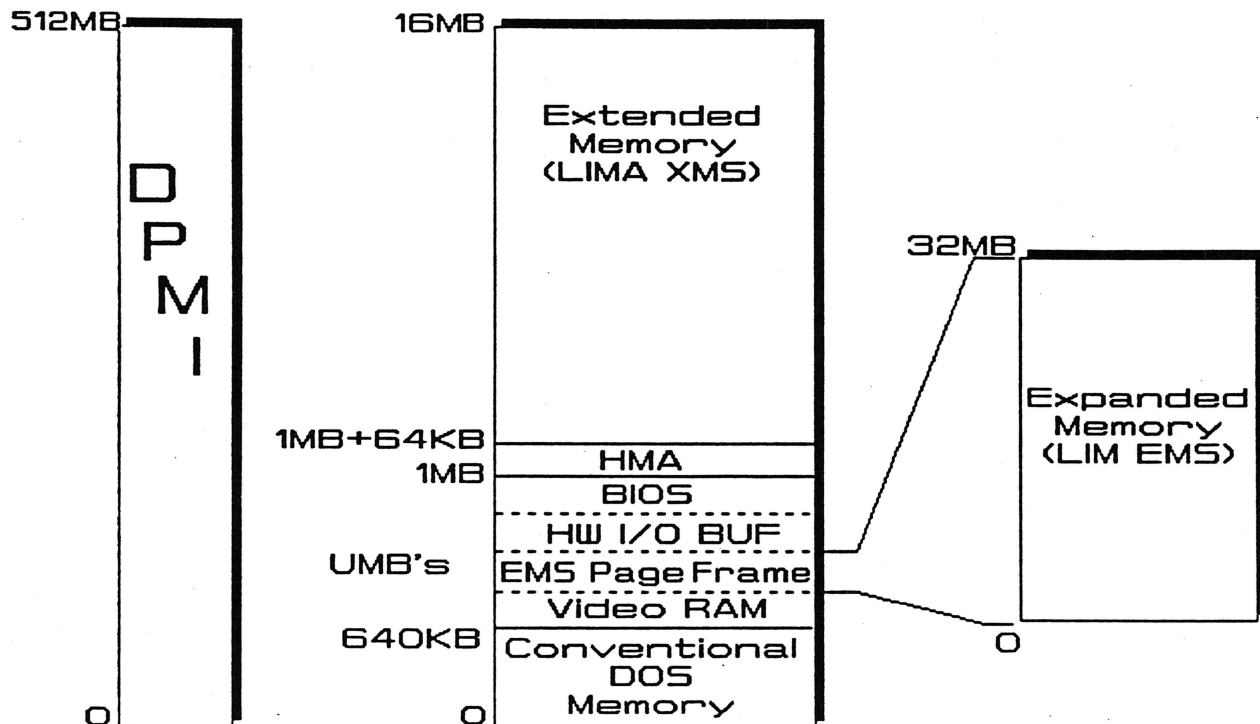
MVDM introduces powerful DOS application support to OS/2 by exploiting the virtual 8086 (V86) mode of the Intel 80386 processor, allowing the emulation of an Intel 8086\*\* processor and associated hardware devices within a protected mode 80386 task. OS/2 uses the virtual 8086 mode to create multiple instances of independent Virtual DOS Machines (VDMs). Through this technique, a virtual interface is provided to each virtual DOS machine, giving the impression that the application running in that machine owns all the required resources, hardware and software.

Each virtual DOS machine runs as a protected mode process, in a manner similar to an OS/2 application. The use of protected mode allows preemptive multitasking of DOS applications and provides a protected system environment in which DOS applications can execute.

DOS Emulation emulates the function and operation of the DOS operating system on a per-VDM basis, using the DOS settings associated with the VDM to configure the environment. Each VDM emulates an entirely independent instance of DOS. Input/output to real devices is supported by virtual device drivers (VDDs) which interface to the physical device drivers. The VDD handles simultaneous requests from different applications for the same device.

Dual-thread support is provided inside the MVDM. This allows many DOS multimedia applications to run smoothly by simultaneously reading from disk and painting the screen or playing sound.

## DOS Memory Extenders



P71AP050

### Notes:

OS/2 provides support for applications using DOS memory extenders which allow access of memory above the 1MB real mode address limit of 80286\*\*, 80386, and 80486\*\* processors. **DPMI** (DOS Protect Mode Interface) is a specification that provides a standard interface that can access memory above 1 MB and is addressable by 80x86 microprocessors. OS/2 allows use of up to 512 MB of memory per session.

**Extended memory (XMS)** is actual memory that resides above 1 MB. Extended memory makes 16 MB available for each DOS application.

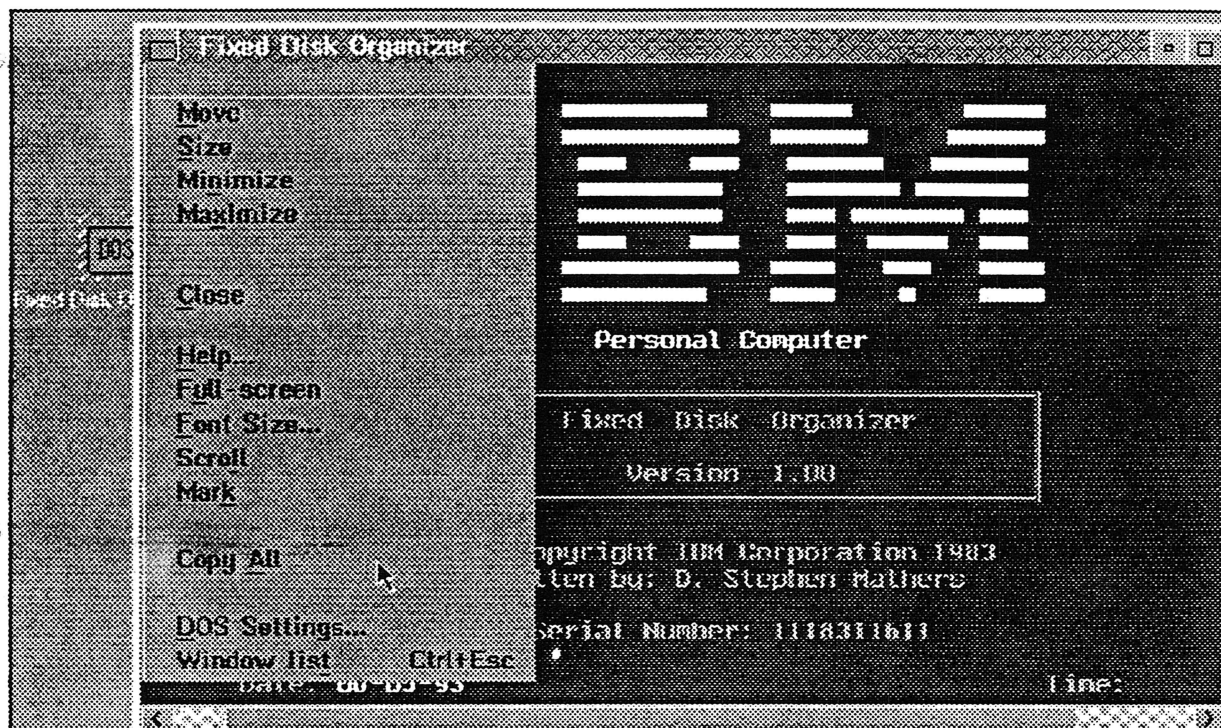
**Expanded memory (EMS)** uses a 64-KB region of memory below 1 MB as "pointers" to memory above 1 MB. Expanded memory makes 32 MB available for each DOS application.

The use of DPMI, XMS and EMS memory is application-dependent. Note that since memory seen by the application is virtual, **each** VDM can have the maximum amount of memory supported. However, allocating virtual memory takes **real** physical memory even if the memory is not used. In general, each application should be configured for the memory it actually uses.

Refer to Appendix E for a more detailed map of memory and definition of terms.



## DOS Session



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### Notes:

DOS sessions can be run in full-screen or windowed modes. The startup session type can be set on the Session page of the object's Settings notebook.

An active DOS session can be switched between full-screen and windowed modes by pressing the Alt and Home keys. Note: You can not use the HOME key on the numeric keypad.

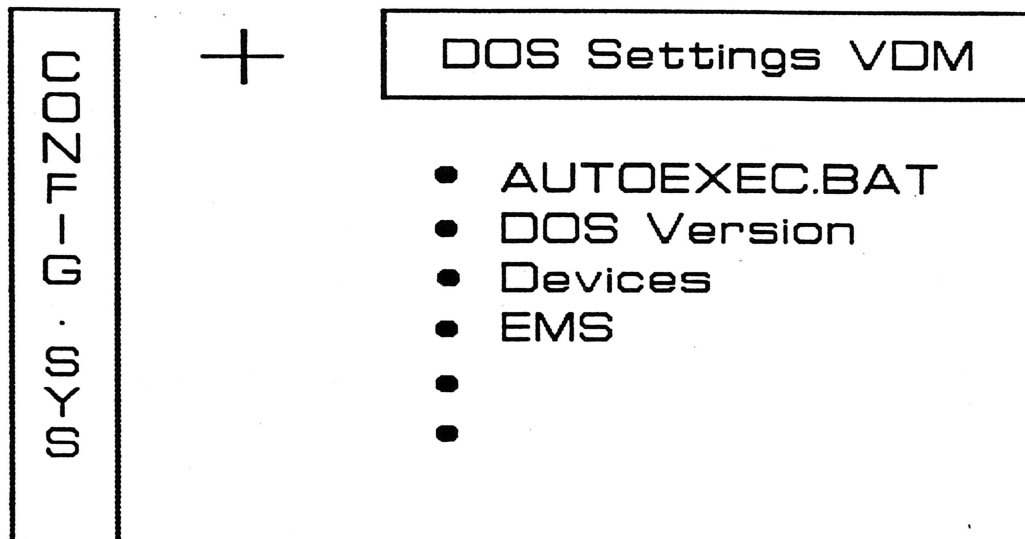
Note that a full-screen session must be switched to windowed in order to access the pop-up menu of the running session.



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## VDM Configuration

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P71AP032

### Notes:

VDM behavior and features are configured using:

**CONFIG.SYS**      Settings specified here will apply to all VDM sessions.

**DOS Settings**      These "CONFIG.SYS" parameter settings are established on an individual VDM basis.

For example, if device driver support for a DOS application is not provided by an OS/2 Virtual Device Driver, then the needed DOS device driver may be specified in the application VDM Settings notebook using the DOS\_DEVICE parameter. Specifying the device driver in CONFIG.SYS would result in the driver being made available to all VDMs.

Note that a unique AUTOEXEC.BAT file can be associated with each DOS or Windows program object. This is specified using the DOS\_AUTOEXEC parameter in the application's Settings notebook.

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## AUTOEXEC.BAT

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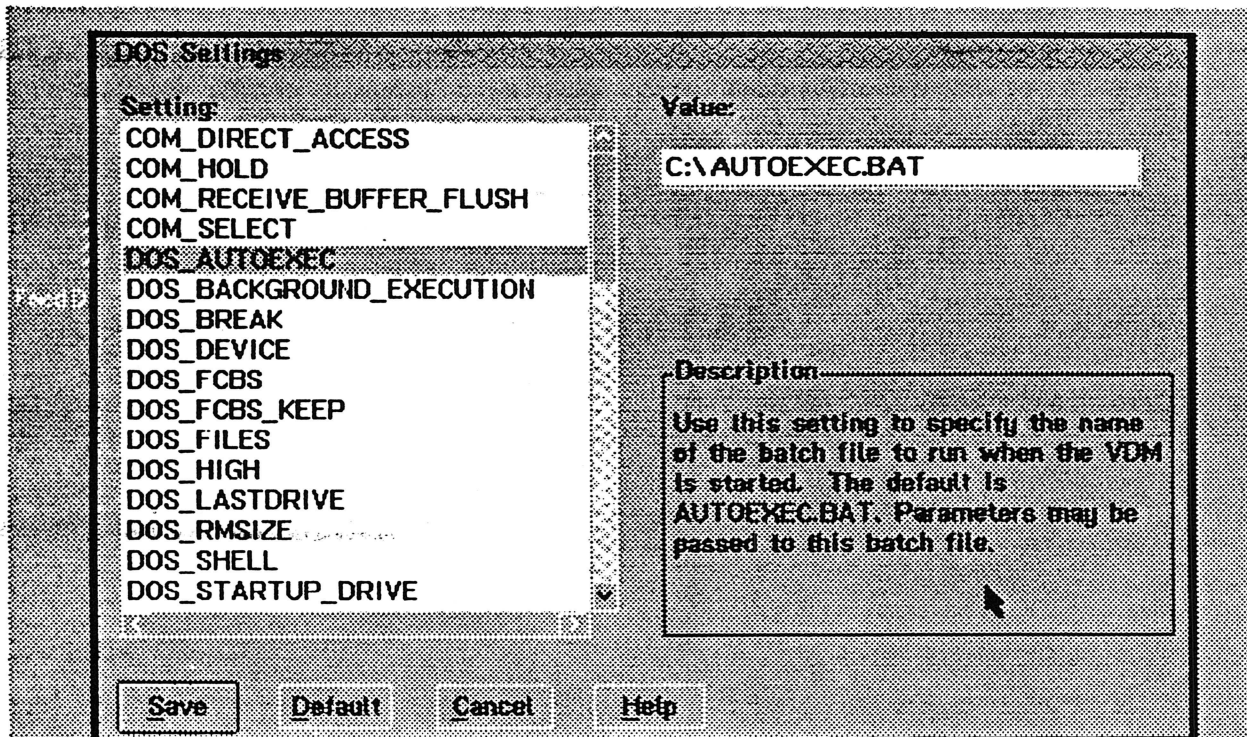
- Used only by DOS to configure VDMs
- Runs each time a VDM is started
  - Each VDM may have a unique AUTOEXEC.BAT
- Default in root directory of OS/2 install drive
  - Path statements to MDOS
  - Use as template for unique AUTOEXEC.BAT files

---

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### Notes:

## DOS Settings



P718P070

### Notes:

In native DOS systems the DOS environment and parameter settings are specified in CONFIG.SYS and AUTOEXEC.BAT files. While the OS/2 2.1 CONFIG.SYS file can specify some DOS settings, changing settings is quite easy. Clicking on **DOS Settings** displays a dialog box with the DOS settings that can be changed. The setting and an explanation of what the setting represents are shown. In addition, sliders, radio buttons, or list fields are used to facilitate entry of the desired value.

While a DOS session is active some of its settings can be changed. To access this dialog box, select **DOS Settings** from the session menu. Settings changed dynamically are effective only in the active session. Permanent settings changes must be made using the application's Settings notebook before the application is started.

---

## Performance Settings

---

DOS Settings that can improve application performance:

DOS\_BACKGROUND\_EXECUTION  
DOS\_FILES  
HW\_ROM\_TO\_RAM  
HW\_TIMER  
IDLE\_SECONDS  
IDLE\_SENSITIVITY  
VIDEO\_FASTPASTE

P71RP080

### Notes:

**DOS\_BACKGROUND\_EXECUTION:** Some DOS or Windows applications do not need to run in the background. Changing this setting of OFF improves overall system performance by eliminating timeslices for unused applications.

**DOS\_FILES:** Can speed file operations of applications that use a large number of files for internal and external purposes.

**HW\_ROM\_TO\_RAM:** Copies contents of ROM to RAM, thus speeding certain BIOS operations and improving system performance.

**HW\_TIMER:** Allows timing-critical applications to have direct access to the 8235 timer ports, allowing them to run more effectively.

**IDLE\_SECONDS:** Allows OS/2 to determine if an application is idle. If the application is idle for X seconds, OS/2 reduces the timeslices given to that application, thus improving overall system performance.

**IDLE\_SENSITIVITY:** If an application is operating below a threshold of its potential maximum polling rate (that is, if the application is idle), OS/2 will reduce the number of timeslices given to that application, thus improving overall system performance.

**VIDEO\_FASTPASTE:** Speeds paste functions from the Clipboard to DOS VDMs by reserving a portion of memory for that purpose.

## Memory Settings

---

DOS Settings that can conserve system memory:

DOS\_FCBS  
DOS\_HIGH  
DOS\_LASTDRIVE  
DOS\_RMSIZE  
DOS\_UMB  
DPMI\_MEMORY\_LIMIT  
EMS\_MEMORY\_LIMIT  
VIDEO\_MODE-RESTRICTION  
VIDEO\_ONDEMAND\_MEMORY  
XMS\_MEMORY\_LIMIT

P71RP090

### Notes:

**DOS\_FCBS:** If your DOS or Windows application requires less than 16 file control blocks (default), reducing this setting will save memory.

**DOS\_HIGH:** Allows the DOS kernel to be loaded outside the 640KB memory area usually allocated for it, thus freeing that area for applications and data.

**DOS\_LASTDRIVE:** Each DOS drive designation (A:, B:, etc.) requires 10 bytes of memory. Change this setting to the actual drive designations installed on your system.

**DOS\_RMSIZE:** Some DOS applications, such as TSRs (Terminate and Stay Resident), do not require 640KB of memory (default). Reduce this number if your DOS application uses less memory.

**DOS\_UMB:** Allows DOS applications, such as TSRs, to be loaded in the Upper Memory Block area, thus saving space in 'low' memory for other applications.

**DPMI\_MEMORY\_LIMIT:** If your application uses the DPMI driver, but does not require 64MB of memory (default), reduce this setting to the amount of memory required by the application.

**EMS\_MEMORY\_LIMIT:** If an application uses the EMS driver, but does not require 2MB of memory (default), reduce this setting to the amount of memory required by the application.

**VIDEO\_MODE\_RESTRICTION:** If your DOS application was designed to run in CGA or EGA modes, change this setting to the appropriate mode, thus reducing the amount of memory reserved for video display. This will increase conventional memory beyond 640KB.

**VIDEO\_ONDEMAND\_MEMORY:** When ON, this setting 'frees' the area of memory that is used as a video buffer for full-screen VDMs for other purposes.

**XMS\_MEMORY\_LIMIT:** If an application uses the XMS driver but does not require 2MB of memory (default), reduce this setting to the amount of memory required by the application.

## Checkpoint

1. What is the feature of the 80386 chip that OS/2 uses to provide protection of one DOS application from another?  
Protect mode
2. What key combination is used to switch a DOS full screen session to a window on the Desktop (and vice versa)?  
ALT + HOME
3. What action should be tried if a DOS program runs out of memory?  
CLOSE and re-configure DOS options.
4. Are dynamically configured DOS (and WIN-OS/2) settings permanently saved?  
NO
5. All DOS applications on your customer's system need a special device driver that is not supported by an OS/2 VDD. Where is the device statement specified?  
CONFIG.SYS
6. Your customer has four applications which will run concurrently. Each requires 8MB of extended memory. Can these four applications run successfully?  
YES - MUDM

## **Exercise 8.1 Configuring VDMs for DOS Applications**

### **What This Exercise is About**

DOS and Windows application support make OS/2 the integration platform for applications. Native DOS uses CONFIG.SYS to configure the DOS environment. When running DOS programs under OS/2, CONFIG.SYS and DOS Settings are used to configure how the application uses the hardware and operating system software resources. In this exercise, you will configure VDMs for DOS applications.

### **What You Should Be Able To Do**

At the end of this exercise, you should be able to:

- Use online helps as needed to learn about settings parameters.
- Install a DOS application.
- Modify DOS Settings to customize how an application runs.

## Exercise Instructions

### Explore dynamically configured DOS Settings.

- \_\_\_\_ 1. Create a copy of the **DOS full screen command prompt** on the desktop and name it **User DOS**.
  - Locate the prompt in the **Command Prompts** folder.
  - Holding the **Ctrl** key down, drag with mouse button 2 and drop on Desktop.
  - Name it **User DOS**.
- \_\_\_\_ 2. Open **User DOS** and type **MEM**. Press **Enter**.
 

How much free memory does this VDM have?

Program 610668 EMS 2097152 XMS 2031616
- \_\_\_\_ 3. Use the **Alt+Home** key combination to switch the full screen DOS session to a window display and display the **User DOS** pull-down menu.
- \_\_\_\_ 4. Select **DOS Settings**.

These are the parameters which can be dynamically configured while the session is running. They are a subset of the VDM parameters which are configured using the object's Settings notebook.

Do you see any parameters which affect allocation of EMS, XMS, or DPMI memory? \_\_\_\_\_

Parameters which configure memory extenders or parameters to load DOS code above 640KB are not included in the list because they cannot be dynamically configured. VDM memory is allocated when the VDM is initiated. Note that parameters for hardware such as the mouse and keyboard can be configured dynamically.

- \_\_\_\_ 5. Press **Cancel**; close the **User DOS** command session by double clicking the title bar icon. A command session can also be closed by typing **Exit**.

### Change the **DOS\_HIGH** setting to on and increase DOS program memory to >630KB.

- \_\_\_\_ 1. Display the **User DOS** object pop-up menu and open the **Settings** notebook and select the **Session** page.



- \_\_\_\_ 2. Press the **DOS Settings...** button on the **Session** page.
- \_\_\_\_ 3. Locate and select the **DOS\_HIGH** parameter. Note the **Description** box contains information for the selected parameter. Current parameter values appear in the **Value** area.
- \_\_\_\_ 4. Change the **Value** of **DOS\_HIGH** to **ON**.

**Experiment with other parameters that affect memory. Refer to page 8-10 for a list of parameters or use the Help.**

- \_\_\_\_ 1. Scroll through the parameter list and select the **XMS memory limit** parameter.

How much XMS memory is configured for **this** session? 2046

Use the scrolls or slider bar in the **Value** box to change the value to **4096KB**.

- \_\_\_\_ 2. Note that changes to DOS Settings do not take effect immediately and are not automatically saved when the Settings notebook is closed. **Save** your changes to the DOS Settings; and close the **Settings** view.
- \_\_\_\_ 3. Open the **User DOS** prompt again. How much memory is available now?

Program 636117 EMS 2097152 XMS 4128768

Close the **User DOS** session.

- \_\_\_\_ 4. OPTIONAL: Here is another way to add more program memory to the VDM. Return to the **Settings** notebook of the User DOS object.

Read about **VIDEO\_MODE\_RESTRICTION** and change the **VIDEO\_MODE\_RESTRICTION** parameter to **MONO**. **Save** your changes and close the settings notebook. Open the **User DOS** prompt and observe that more memory is available when this change is made.

Program 701392 EMS 2097152 XMS 4128768

- \_\_\_\_ 5. Close the **User DOS** command prompt session.

**Optimize a DOS application.**

- \_\_\_1. Copy the **Unit8** folder on the **Student Diskette** to **Drive D:\**.
- \_\_\_2. Use a **Program** template to create a program object for the program **TUNNEL.COM**.
  - On the **Program** page of the Settings notebook complete the following fields:  
  
Path and filename: **D:\UNIT8\TUNNEL.COM**  
Parameters: **(leave blank)**  
Working directory: **D:\UNIT8**
- \_\_\_3. Set the program to run as a **DOS Full screen** application.
  - Turn to the **Session** page.
  - Push the **DOS Full screen** radio button.
- \_\_\_4. Name the program reference object **Tunnel**.
  - Turn to the **General** page.
  - Change the text in the **Title** entrybox from Program to **Tunnel**.
  - Close the **Settings** notebook.
- \_\_\_5. Run the program.
  - Start the Tunnel program. What looks wrong? If your PC is an older IBM model 70 or 80, you should see "snow".
  - End the program after you have viewed it.

You may press the **ALT+HOME** keys to switch the program to a window and then select Close from the menu. Alternatively, use the **CTRL+ESC** key combination to display the Window List and close the program.

\_\_\_\_ 6. Make the following changes to the object's DOS Settings to improve performance and fix the problem.

- Eliminate the 'snow' by changing two DOS settings:

**VIDEO\_RETRACE\_EMULATION**, to **OFF**  
**VIDEO\_8514A\_XGA\_IOTRAP** to **OFF**

- Change the DOS setting **DOS\_BACKGROUND\_EXECUTION** to **OFF**. There is no need for this program to run when it is not the active session.
- Press the **Save** pushbutton to save the modified DOS settings.
- Close the **Settings** notebook.

\_\_\_\_ 7. Run the optimized program and verify that configuration is optimal.

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## Windows Application Support

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- IBM's WINOS2.COM
  - Windows 3.1 standard and enhanced mode
- Maintains previously installed Windows environment or creates a similar desktop
- Execution tailored via application settings

P218P100

**Notes:**

OS/2 provides support for the execution of Windows applications within the Multiple Virtual DOS Machines (MVDM) architecture. This allows concurrent execution of multiple Windows applications, using Standard and Enhanced modes. DOS Protected Mode Interface (DPMI) and Windows services are provided as required by a Windows application.

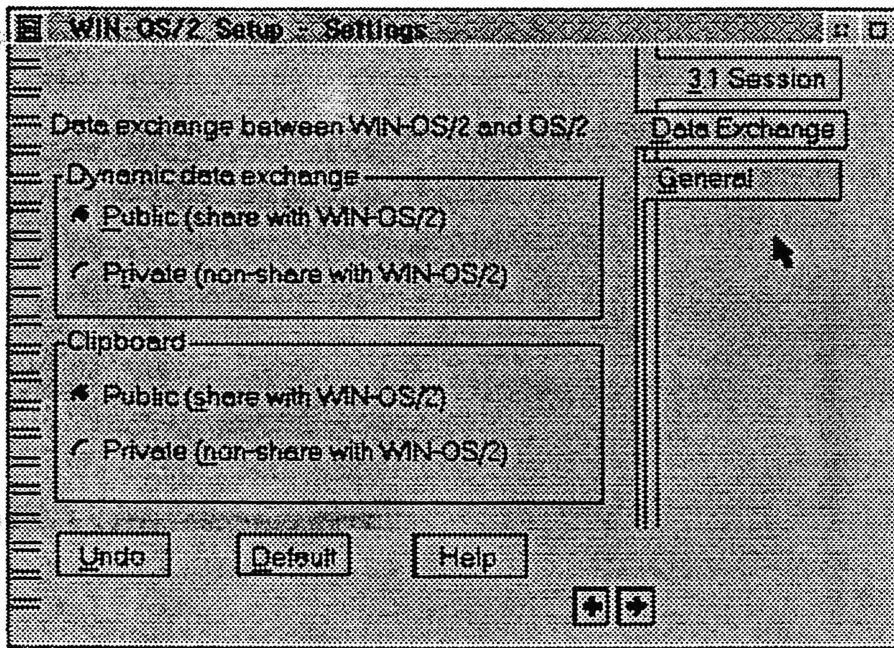
Under OS/2, Windows applications are treated as special cases of DOS applications, which need a special environment in which to run (WINOS2.COM).

Regardless of whether the Microsoft Windows product has actually been installed, Windows applications run in any of the modes discussed.

If you wish to preserve a previously installed Microsoft Windows environment, Windows configuration data can be retained at installation time and be used to create the WIN-OS/2 Program Manager desktop.

If the previously installed Windows environment is not retained, or if Microsoft Windows was not installed, the default WIN-OS/2 Program Manager is provided.

## Exchanging Data



- Clipboard
- DDE
- OLE

P218P102

### Notes:

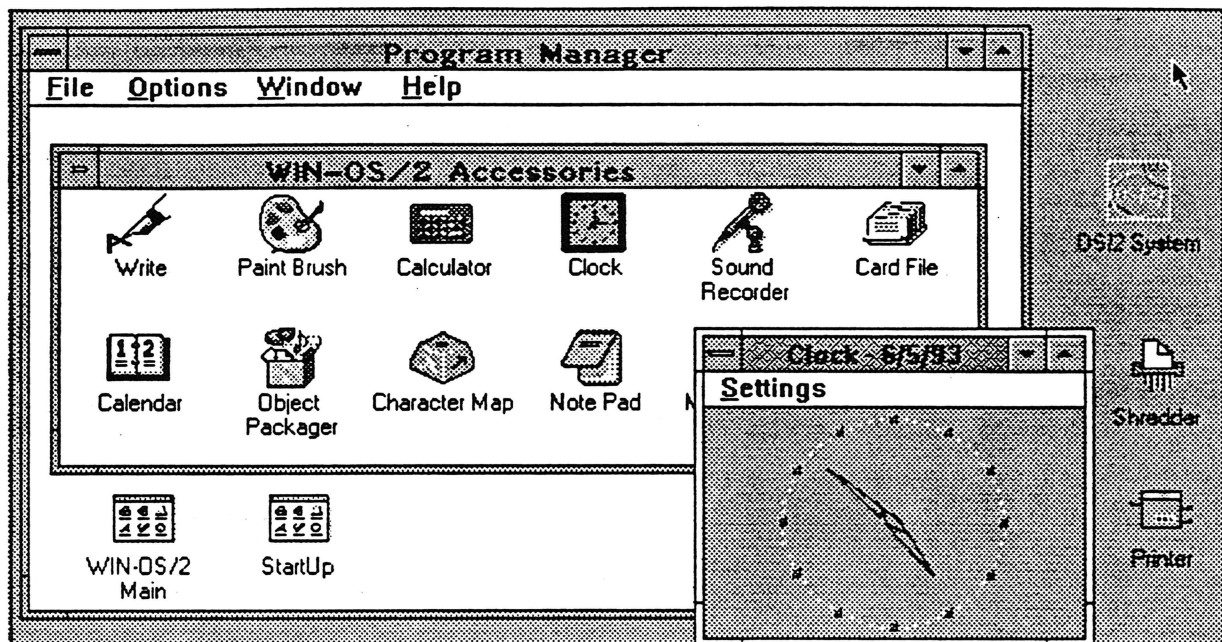
The WIN-OS/2 Setup object (in the System Setup folder) provides for global configuration of how WIN-OS/2 and OS/2 will share DDE and Clipboard data.

The Clipboard provides temporary storage area for user-initiated data transfer between applications - DOS, Windows, or OS/2.

Dynamic Data Exchange (DDE) is a protocol and set of functions that enables Windows applications to exchange data through program-to-program communication.

Object Linking and Embedding (OLE) enables the creation of compound documents. These documents can be created with "links" to parts of other documents created by different applications; or they can contain embedded sections of other documents. Note that OLE is supported for applications within the **same** session. OLE allows dynamic exchange of data between the two or more applications participating: updating the data in one application (the server) results in automatic update to the data in any application (client) linked to the server. The client need not be running; it will be started and data updated when the server data is updated.

## Running Windows Applications



P 718P110

### Notes:

Configuring Windows applications to operate "seamlessly" on the OS/2 desktop provides true operating system transparency for the end user:

- Windows applications appear on the desktop, as do OS/2 and windowed DOS applications.
- The need to switch between the WIN-OS/2 desktop and the OS/2 desktop is removed.
- Only one interface, the OS/2 desktop, must be learned.

Windows applications can run on the OS/2 desktop in a single shared VDM, or each application may run in its own, or private, session.

Applications may also run in the WIN-OS/2 Program Manager environment. Applications started from the Program Manager share the same VDM. The Program Manager can appear on the OS/2 desktop or can be run full-screen.

## Choosing How to Run Your Windows App.

	Full screen application	Full screen Program Manager	Seamless	
			Shared	Separate
<b>Application Performance</b>	<b>Fastest</b>		Slower	
<b>Memory Used</b>	<b>More if two apps</b>	<b>Less-All share same</b>	<b>Less</b>	<b>More</b>
<b>DDE</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>Clipboard</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
<b>OLE</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Crash</b>	<b>Only the one app.</b>	<b>All apps in the VDM</b>	<b>All in VDM</b>	<b>Only one</b>
<b>Access OS/2 Desktop</b>	<b>Ctrl+Esc</b>	<b>Ctrl+Esc +Select</b>	<b>Immed.</b>	<b>Immed.</b>
<b>Shared memory</b>	<b>No</b>	<b>Yes</b>	<b>Yes</b>	<b>No</b>
<b>Settings</b>	<b>Unique for session</b>	<b>Shared settings</b>	<b>Shared</b>	<b>Unique</b>

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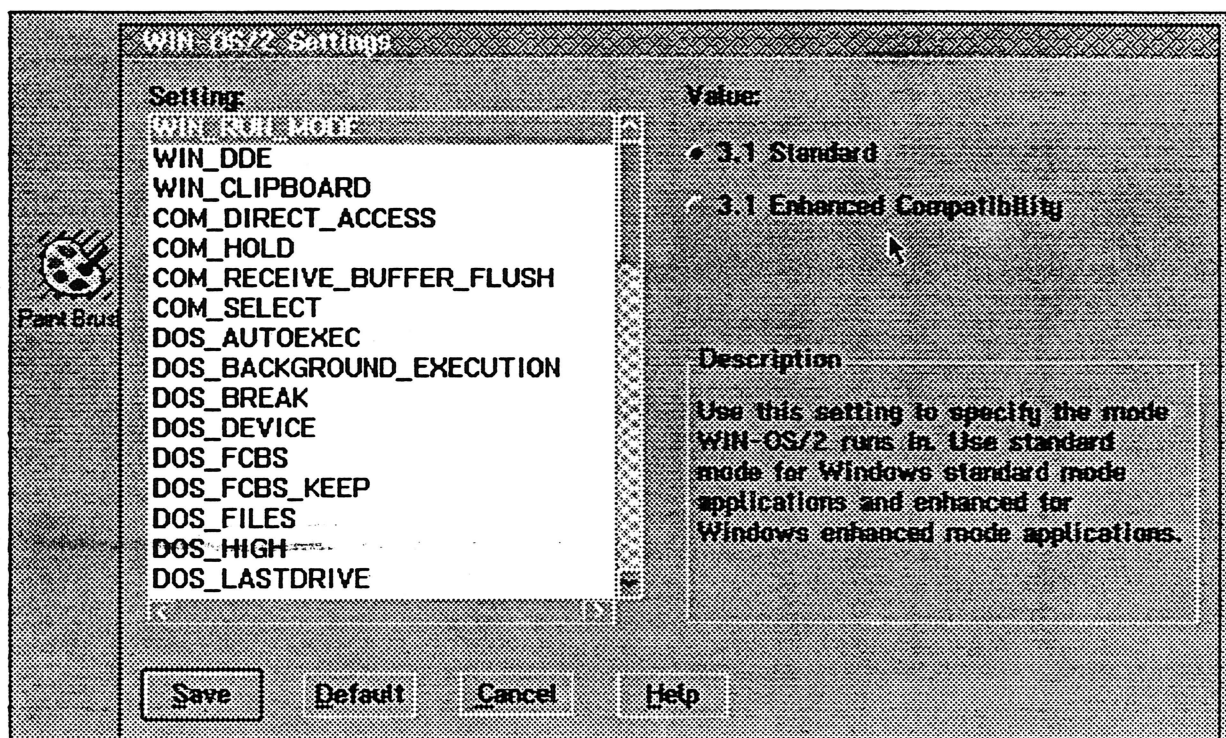
### Notes:

WIN-OS/2 provides performance equivalent to native Windows 3.1 for applications running full-screen. Applications running on the OS/2 desktop run about 10% slower than native Windows 3.1.

Although applications sharing a VDM may interfere with one another, overall system use of memory is less than starting a separate VDM for each application.



## WIN-OS/2 Settings



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### Notes:

Windows applications are configured using their Settings notebooks. Parameters include those used for DOS applications. In addition, applications can be specified to run in Windows 3.1 Standard or Enhanced mode under OS/2 2.1. These options are chosen by selecting the WIN-OS/2 setting **WIN\_RUNMODE**.



## Installing Applications

---

### Four-step process

- Check the OS/2 documentation for specific application tips
- Install the application
- Migrate the application
  - Create program reference objects
  - Optimize settings
- Associate the application to its data files

---

P218P150

### Notes:

**References:** *Using the Operating System*, Chapter 26, contains installation and settings information for many popular applications. In addition, the README file in the Information folder provides application information.

**Installation** loads the application's files on your hard disk. Once an application has been installed, it can be started by double-clicking its executable file or from a command prompt. Note: You should install fonts, printers, and other aids shipped with the application.

**Migration** sets up the application so that it can easily be used from the desktop. DOS and Windows parameters are set (if appropriate), and a program reference object is created.

**Association** relates applications and data files. If data files are associated with certain applications, the data files can be opened in the appropriate application directly; you do not need to start the application and then load the data file.

Many OS/2 programs create program reference objects during installation and set up association data types to be used with their data files. Some provide data file templates which are added to the Templates folder.

## Program Objects

### Program File Objects

- \*.EXE, \*.COM, etc.
- Size is program dependent
- Delete = Program GONE

### Program Reference Objects

- Pointer to real \*.EXE, etc.
- Contains only Pointer data
- Delete = Real Program Unaffected
- Many to one possible

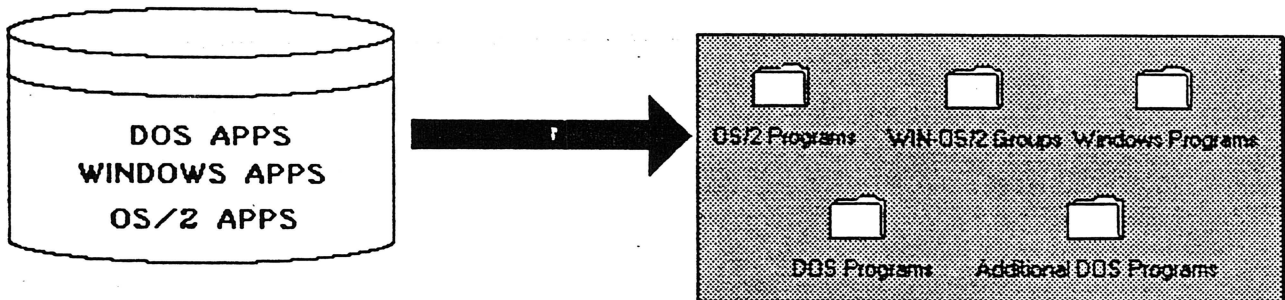
P71RP140

### Notes:

Program file objects are program \*.EXE files or program references. The \*.EXE file should be left in the install directory. Program reference objects are small objects which define how an application session will execute. To make a program available anywhere on the system, use program reference objects. These can be created using the **Program** template or by running the Migrate Applications program. You can have many different DOS or DOS/Windows program references pointing to the same application \*.EXE file, each configured to execute in a different VDM environment.

		*.EXE	Program Reference
<u>Views:</u>	Settings	X	X
	Program	X	X
	OS/2 System Editor	X	
	Other	X	
<u>Settings tabs:</u>	Program	X	X
	Session	X	X
	Association	X	X
	Type	X	
	Menu	X	
	File	X	
	Window		X
	General	X	X
<u>Size:</u>		Of *.EXE file	"No" size
<u>Location:</u>		Program Install directory	Anywhere needed

## Migrating Applications



- Perform migration at installation or from System Setup folder
- Database assist with individual application settings

P718P160

### Notes:

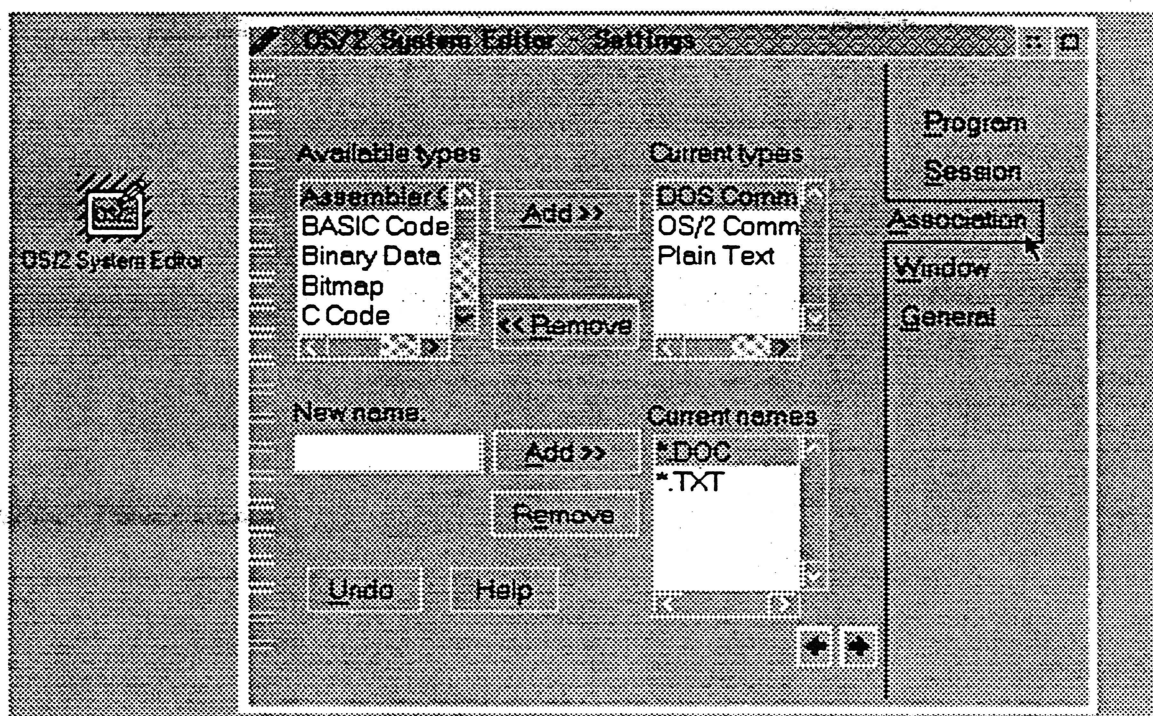
If you have previously-installed programs on your hard disk and did not choose to format your hard disk during installation, program references are created and saved in folders on the desktop. This function is performed by the Migrate Applications program. During installation, the migration program will also initialize settings for programs using the application database located in \OS2\INSTALL\DATABASE.DAT.

Program folders are created for DOS, Windows, and OS/2 applications found on the disk during the migration, including WIN-OS/2 groups if WIN-OS/2 is installed.

Additional folders are created for applications not found in the database, but which are manually added to the system using the Add Programs function of the migration application. Settings for these programs will be system defaults.

Users can also add to or modify this database for their own applications. The PARSEDB command is used to modify or create the database. PARSEDB uses a processing file (DBTAGS.DAT) and an ASCII input file to create the database. Procedures are located in the Master Help Index and in the Command Reference.

## Data File Association



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### Notes:

Associating programs and data files is a key feature of object-oriented operating systems. Associating allows you to work directly with the data rather than having to start applications first. There are three basic ways to associate data files with programs.

**Associating by file name** allows you to use a filter to associate files with similar names or extensions to an application. For example, you can associate all \*.WK1 files with Lotus 1-2-3\*, \*.DOC files with the Enhanced Editor, and all \*.TXT files with DisplayWrite\*. If you open TEST.WK1, Lotus 1-2-3 will be started with TEST loaded. To associate files by file name, go to the **Association** page of the application's Settings notebook and add the appropriate names in the lower window.

**Associating by file type** allows you to associate certain types of objects with specific applications. For example, you can associate all Plain Text data file objects with the Enhanced Editor, and all bitmap objects with the Icon Editor. To associate files by file type, go to the **Association** page of the application's Settings notebook and add the appropriate types in the upper window.

**Associating from menu page** allows you to associate a specific data file object with a specific program. If, for example, all \*.TXT files are associated with DisplayWrite, but you want FUNNY.TXT to be associated with the Enhanced Editor, you can change FUNNY's association. This change is made from the **Menu** page of the object's Settings notebook.

The result of associating a data file with an application is the addition of the application as an action in the Open option of the data files pop-up menu.

## Checkpoint

1. What is the main performance advantage of running Windows applications in a shared VDM session? \_\_\_\_\_
2. What are two disadvantages?
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
3. Why might WIN-OS/2 Program Manager mode be important to your customers?  
\_\_\_\_\_
4. What are two main advantages of using program reference objects?
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
5. List two advantages of using the migration program for DOS and Windows programs.
  - (a) \_\_\_\_\_
  - (b) \_\_\_\_\_
6. How would you set the Ctrl + Esc key sequence to immediately display the Window List when using the WIN-OS/2 Full Screen command prompt session?  
\_\_\_\_\_

## Exercise 8.2 Installing and Migrating Applications

### What This Exercise is About

OS/2 includes a default database of specifications for certain DOS, Windows and OS/2 programs. This database, which is installed in the OS2/INSTALL directory, is named DATABASE.DAT. When you install OS/2 and migrate existing DOS, Windows and OS/2 programs, this default database is searched. If your existing DOS, Windows and OS/2 programs are listed in the database, they are placed in folders on the OS/2 desktop, and the appropriate DOS and WIN-OS/2 settings are applied to them.

After installing a new application, you should run the Migrate Applications program and let it create a program reference on the desktop. If the application is in the database, the system will initialize settings based on commonly-used setup requirements.

### What You Should Be Able To Do

At the end of this exercise, you should be able to:

- Install an application.
- Migrate the application, using the default migration database.

## Exercise Instructions

Your instructor will tell you what Windows application to install in this exercise.

Install \_\_\_\_\_ on the D drive, directory \_\_\_\_\_

Special installation Notes: \_\_\_\_\_

### Install a Windows Application.

- \_\_\_\_ 1. Check the README file for information about the application to see if there are special considerations for the application.
  - Open the **README** file located in the **Information** folder.
  - Use the **Find** option (under Edit) and search for occurrences of the application name. Turn **Case sensitive** off and **Wrap** on.
- \_\_\_\_ 2. Insert **Program Diskette 1** into **Drive A:**.
- \_\_\_\_ 3. Open a **WIN-OS/2 full screen** command session. Select **File** on the action bar. Select **Run**.
- \_\_\_\_ 4. Type **A:INSTALL** and press **OK** to start the program installation.
- \_\_\_\_ 5. Follow the installation instructions; refer to special notes above if needed. When prompted for the install location, specify the **D** drive. Accept any default directory name.
- \_\_\_\_ 6. When the installation completes, close the Program Manager and exit the WIN-OS/2 command session.

This completes the installation of the application.

### Migrate the Program (Create a program reference on the OS/2 desktop and initialize the program Settings using the database.)

- \_\_\_\_ 1. Open the **System Setup** folder, start the **Migrate Application** utility and search for **Windows** programs on Drive **D** with '**Find**.'
  - Display the desktop pop-up menu and select **OS/2 System** object,
  - Start the **Migrate Applications** program.

- Deselect the **DOS programs** and **OS/2 programs** options by clicking their respective checkboxes. This will limit the search to Windows programs only.
- Deselect all drives except **D:**.
- Press the **Find** button. The system will search the selected logical drives for Windows programs. The installed Windows applications are displayed in the **Applications** listbox.
- Verify your newly-installed program is in the list.

\_\_\_\_ 2. Migrate all the applications found. These include other Windows applications which were installed as part of the WIN-OS/2 support.

- Press the **Migrate** pushbutton.
- Press **OK** and you will be returned to the Find Programs window.
- Press the **Exit** pushbutton to complete the migration process.

\_\_\_\_ 3. Open the **WIN-OS/2 Groups** folder and locate your newly-installed program icon.

Note: Some programs create a new group and insert their icons in the group.

\_\_\_\_ 4. Run the program.

- Double-click on the icon to run the program. Close all windows when you have finished.



## Exercise 8.3 Create a Migration Database

### What This Exercise Is About

In Exercise 8.1, you changed the following settings for the TUNNEL.COM program:

- VIDEO\_8514A\_XGA\_IOTRAP
- VIDEO\_RETRACE\_EMULATION
- DOS\_BACKGROUND\_EXECUTION

In this exercise, you will build a database to be used by the Migrate Applications utility which will automatically configure the application.

This program does not require EMS or XMS memory. Even if a program does not use this memory, some memory resource is used if the VDM is initialized to support the memory. You will customize the application to use neither XMS nor EMS resource.

### What You Should Be Able To Do

At the end of this exercise you should be able to:

- Create a migration database for a customer's unique application portfolio.

### References

- *OS/2 2.1 Installation Guide*, Appendix D, Setting up a Migration Database

## Exercise Instructions

Create an input text file and create the database.

The first step in creating a migration database is to create a text file that lists the settings of the programs that you want to migrate into the OS/2 environment. Once the text file has been created, you will use a utility, PARSEDB, to compile the file into a binary database. The binary database is used by the Migrate Applications utility to migrate applications to OS/2.

You will use SAMPDB.TXT, located in the **UNIT8** folder on the D drive as the basis for your database text file. SAMPDB.TXT is actually a subset of the file DATABASE.TXT file, located in the \OS2\INSTALL subdirectory.

Once the database text is completed, you will run the PARSEDB utility program to compile the file into a binary database. This binary database will be used by the Migrate Applications utility.

- \_\_\_ 1. Open the **UNIT8** folder on **Drive D** and open the file **SAMPDB.TXT**.
- \_\_\_ 2. Use the OS/2 System Editor to modify the **SAMPDB.TXT** file so that the fields are as follows. (Hint: Double-click on the file and make the editor full screen.) Read the body of the database text for an explanation of the database fields. **Do not delete the blank line** after the EMS\_MEMORY\_LIMIT statement; it indicates end of input for PARSEDB.

```

REM Tunnel Migration Database
REM This DOS application is supplied by Dan Butterworth, IBM Corp.
REM
REM
NAME                TUNNEL.COM
TITLE               Tunnel
TYPE                DOS
ASSOC_FILE          NULL
DEF_DIR             D:\UNIT8
DOS_BACKGROUND_EXECUTION OFF
VIDEO_8514A_XGA_IOTRAP OFF
VIDEO_RETRACE_EMULATION OFF
XMS_MEMORY_LIMIT    0
EMS_MEMORY_LIMIT    0

REM ****You MUST leave a blank line at the end of the input.
REM
REM End of database

```

\_\_\_\_ 3. Use **Save as...** to save the **SAMPDB.TXT** file on the **root** directory of **Drive D** and close the editor.

\_\_\_\_ 4. At an OS/2 command prompt, enter the following command to compile the SAMPDB.TXT file into a binary database, SAMPDB.DAT:

**PARSEDB C:\OS2\INSTALL\DBTAGS.DAT D:\SAMPDB.TXT D:\SAMPDB.DAT**

- You should see the following text after pressing the **Enter** key:

**Lines: 18 Applications: 1**  
**Writing "D:\SAMPDB.DAT" ... done!**  
**Processed 1 DOS apps, 0 Windows apps, and 0 OS/2 apps**

- If any error messages are displayed, notify your instructor or lab assistant.
- Close the OS/2 command prompt.

### **Migrate the application using the new database.**

\_\_\_\_ 1. Migrate the **Tunnel** application using your new database, **SAMPDB.DAT**.

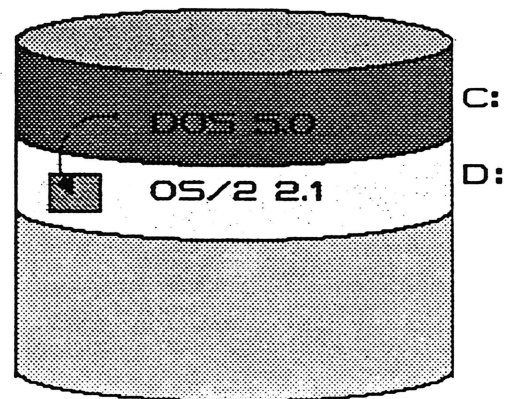
- Start the **Migrate Applications** utility.
- Replace the text in the **Database Used for Find Option** entrybox with the path and filename of your binary database: **D:\SAMPDB.DAT**.
- Set the program to search the **D** drive for **DOS** applications.
- Press **Find**. When the application appears in the list, press **Migrate**.
- **Exit** when complete.

\_\_\_\_ 2. Open the **DOS Programs** folder and verify the Tunnel program runs correctly.

\_\_\_\_ 3. Exit and close all windows.

## DOS & OS/2-Virtual Machine Boot (VMB)

- Actual DOS system diskette
- Image of a DOS system diskette saved on the fixed disk
- DOS partition on the fixed disk



P71AP190

### Notes:

Most DOS programs run in the DOS support that is provided with OS/2 2.1. However, if you have a program that must run under the native DOS operating system, you may not have to shut down OS/2 to run the program. You may be able to run the program from the OS/2 desktop, using VMB.

There are three ways that you can accomplish this:

- Set up a DOS session that points to a DOS startup diskette inserted in a diskette drive.
- Create a diskette image of a DOS startup diskette and place that image in a file in the same partition in which OS/2 exists. Then, set up a DOS session that points to the diskette image file.
- Install DOS in a primary partition and OS/2 in a logical drive within the extended partition. Set up a DOS session from within OS/2 that points to the DOS partition.

If you are going to install DOS in a separate partition, you should create the DOS partition during OS/2 installation. The first two methods do not require any setup during installation.

---

## VMB From DOS Startup Diskette

---

- Create DOS Startup diskette
  - FORMAT A: /s
  - Copy \OS2\MDOS\FSFILTER.SYS to A:
  - Create CONFIG.SYS\*  
DEVICE=A:\FSFILTER.SYS
  - Create AUTOEXEC.BAT  
SET PATH=A:\;A:\DOS  
SET COMSPEC=A:\DOS\COMMAND.COM  
(drive):\OS2\MDOS\MOUSE.COM
- Copy DOS program files to A:\DOS

P 218P200

### Notes:

The FSFILTER.SYS device driver has two functions:

- Allows the VMB to access the hard drive
- Allows the VMB to "see" and access partitions formatted as HPFS.

The FSFILTER.SYS driver **must** precede any DEVICE statement that points to drivers installed on the hard drive.

Booted DOS in a VDM must use XMS, EMS, DPMS and mouse support from its VDM environment. DOS must not load its own drivers for these functions. Note that if you wish to use XMS or EMS memory, you must specify the appropriate OS/2 (not DOS) drivers in CONFIG.SYS:

```
DEVICE=(drive):\OS2\MDOS\HIMEM.SYS  
DEVICE=(drive):\OS2\MDOS\EMM386.SYS
```

The mouse support is specified in AUTOEXEC.BAT.

Use the **DOS from Drive A:** object in the Command Prompts folder to boot the diskette.

---

## VMB From DOS Startup Diskette Image

---

- Modify DOS Startup Diskette
  - Copy \OS2\MDOS\FSACCESS.EXE to A:
  - Modify CONFIG.SYS      FSACCESS G:=A:
- Create image of DOS Startup Diskette  
VMDISK A: (drive): \<directory>\<image name>
- Create new Program object
  - Path and file name : \*
  - Change DOS Settings DOS\_STARTUP\_DRIVE to (drive): \<directory>\<image name>

P71RP210

### Notes:

Virtual Machine Boot from an **image** of a DOS Startup diskette has two advantages over boot from diskette:

- Faster access
- Convenience (i.e., image cannot be lost).

The **VMDISK** utility creates the binary copy of the diskette on the hard drive. The size of the image is exactly the size of the original diskette. For this reason, use the **smallest** possible disk size to create a bootable DOS diskette.

Because the DOS image on the hard disk is "seen" by OS/2 as the A: drive, the diskette drive (physical A:) must be redirected, via the **FSACCESS** statement. As shown above, the diskette drive is being redirected as the G: drive.

---

## VMB From DOS Partition

---

- Copy FSFILTER to DOS partition  
COPY (DRIVE)\OS2\MDOS\FSFILTER.SYS C:\
- Modify CONFIG.SYS  
DEVICE=C:\DOS\HIMEM.SYS  
DEVICE=C:\DOS\EMM386.EXE NOEMS  
DEVICE=(drive):\OS2\MDOS\HIMEM.SYS  
DEVICE=(drive):\OS2\MDOS\EMM386.SYS
- Modify AUTOEXEC.BAT  
LH (drive):\OS2\MDOS\MOUSE  
LH C:\DOS\MOUSE  
FSACCESS M:=A:
- Create new program object
  - Path and file name : \*
  - Change DOS Settings  
DOS\_STARTUP\_DRIVE to C:

P71RP220

### Notes:

Virtual Machine Boot may be performed from a DOS partition installed on a workstation with Boot Manager. The DOS partition must reside on a primary partition on the first hard disk on the workstation. Since only one C: partition can be active, you must have OS/2 installed in an extended partition.

The sequence of the native DOS Extended and Enhanced Memory Support drivers and the OS/2 "stub" drivers are crucial, and must be entered as shown above. The processing sequence of CONFIG.SYS for these drivers under native DOS is as follows:

- The DOS HIMEM and EMM386 drivers load normally.
- The OS/2 HIMEM and EMM386 drivers, which are OS/2 applications, do not load under native DOS.

The processing sequence of CONFIG.SYS under OS/2 is as follows:

- The DOS HIMEM load fails, as it sees no available extended memory.
- The DOS EMM386 load fails, as it sees protect-mode software already loaded.
- The OS/2 HIMEM and EMM386 drivers load normally.

## Exercise 8.4 Virtual Machine Boot (Optional)

### What This Exercise Is About

An important goal of OS/2 is the ability to run past, current and future DOS programs. Most DOS programs can run unchanged in OS/2's Virtual DOS Machines (VDM) environment. The Virtual Machine **Boot** feature provides the ability to boot an "off the shelf" 8086 kernel into an OS/2 virtual DOS machine. Each 'real' DOS session will run in its own "virtual 8086 machine", with access to hardware controlled by OS/2 and its installed device drivers.

### What You Should Be Able To Do

At the end of this exercise you should be able to:

- Create a DOS Startup diskette.
- Use the VMDISK utility to create an image of a DOS Startup diskette.



## Exercise Instructions

### Create a Virtual Machine Boot Diskette (DOS Startup diskette).

Your instructor will provide you with a DOS 5.0 boot diskette. This diskette has been formatted with DOS, using the /S (system) parameter, and contains the DOS kernel for DOS version 5.0. The diskette also contains the following files:

- AUTOEXEC.BAT
- CONFIG.SYS
- COMMAND.COM

**Tip:** If you make a startup diskette to be used to create an image on the fixed drive (shown later in this exercise), use the *smallest* possible diskette size - preferably 720K. The image placed on your fixed drive will be the size of the *total* startup diskette - including unused space.

1. Insert the **DOS Boot Diskette** in the **A:** drive.
2. Use the OS/2 command prompt to copy **FSFILTER.SYS** to the diskette. The FSFILTER device driver allows a DOS VMB session to 'see' and access an HPFS drive.

- Open an OS/2 command prompt and enter the following command:

**COPY C:\OS2\MDOS\FSFILTER.SYS A:**

3. Use the System Editor to add **DEVICE=** statements to the DOS **CONFIG.SYS** file. Save the modified file on the diskette.

- At the command prompt, enter **E A:\CONFIG.SYS**.
- Add this statement before any **DEVICE** statement in **CONFIG.SYS**:

**DEVICE=A:\FSFILTER.SYS**

- Add these statements to provide support for XMS and EMS memory:

**DEVICE=C:\OS2\MDOS\HIMEM.SYS**  
**DEVICE=C:\OS2\MDOS\EMM386.SYS**

These OS/2 replacements for the DOS Extended Memory Services (XMS) and Expanded Memory Services (EMS) are required for DOS applications that make use of these drivers. The native DOS drivers for these services will not work under the VM boot environment.

- **Save** the altered **CONFIG.SYS** file on the A: drive.

\_\_\_\_ 4. Use the **OS/2 System Editor** to edit the DOS **AUTOEXEC.BAT** file on the DOS diskette, adding mouse support, a path to the command processor, and other parameters.

- Add mouse support for your virtual machine session. Add this line after the Echo statement.

**C:\OS2\MDOS\MOUSE**

- Identify the path and filename of the command processor for this session.

**SET COMSPEC=A:\COMMAND.COM**

- Provide path redirection, a command prompt, and version identification for the virtual machine session.

**PATH = A:\;A:\DOS;  
PROMPT = \$P\$G  
VER**

- **Save** the altered **AUTOEXEC.BAT** file on the A: drive.
- Close the **OS/2 System Editor** and the command prompt.

\_\_\_\_ 5. Test the Startup diskette.

- With the diskette in Drive A, open the Command prompts folder. Start the **DOS from Drive A** prompt.
- Verify DOS 5.0 is started.

\_\_\_\_ 6. Access the HPFS drive F: by typing **DIR F:.** Note only file names conforming to **FAT** structure will be visible.

\_\_\_\_ 7. Use **Ctrl+Esc** to return to the desktop. Use the **Window List** to close the DOS session.

## Modify the Startup Diskette

- \_\_\_\_ 1. Insert your **DOS Startup Diskette** in **Drive A**. Open an OS/2 command prompt and type the following command:

**COPY C:\OS2\MDOS\FSACCESS.EXE A:**

- \_\_\_\_ 2. Use the **OS/2 System Editor** to modify **AUTOEXEC.BAT** by typing **E A:\AUTOEXEC.BAT**. Add the following statement:

**FSACCESS G:=A:**

This allows OS/2 to access the A: drive as G: (OS/2 uses the A: drive to access the image.)

- \_\_\_\_ 3. Save **AUTOEXEC.BAT** on **Drive A** and close the OS/2 System Editor.

## Create an image of the DOS Startup diskette.

- \_\_\_\_ 1. Create a new directory on the **E:** drive, **BOOTIMG**. Use a Folder template or use the MD command.

- \_\_\_\_ 2. In an OS/2 session, run the **VMDISK.EXE** utility and create the boot image and place it on the hard disk. Name the image **DOS 50.VMB**.

**VMDISK A: E:\BOOTIMG\DOS50.VMB**

- \_\_\_\_ 3. Put a copy of the **DOS** from **Drive A:** command prompt on the desktop and name it **DOS 5.0 Boot**.

- \_\_\_\_ 4. Open the **Settings** notebook for the **DOS 5.0 Boot** object change the **DOS\_STARTUP\_DRIVE** setting to **E:\BOOTIMG\DOS50.VMB**.

- Turn to the **Session** page of the Settings notebook.
- Press the **DOS Settings...** button.
- Select the DOS setting **DOS\_STARTUP\_DRIVE**. In the **Value** entry box that appears at the upper right of the DOS Settings window, replace the entry **A:** with **E:\BOOTIMG\DOS50.VMB**
- Press the **Save** button at the bottom of the DOS Settings window.

- Close the **Settings** notebook.

\_\_\_\_ 5. Start the windowed virtual machine session by double-clicking the **DOS 5.0 Boot** object.

\_\_\_\_ 6. List the contents of the HPFS **Drive F**.

**Note:** Files and subdirectories in an HPFS drive that do not match FAT file system specifications are **not** displayed.

\_\_\_\_ 7. Verify that you can access the A: drive.

- Place your **Student Diskette** in Drive A.
- Type **G:** at the prompt. Do a **DIR** on Drive A.

\_\_\_\_ 8. Return to the desktop and close the DOS session. Remove your Student Diskette from Drive A.



## Unit 9. Support Resources

### What This Unit is About:

Many online tools and documents are available for your use when you have problems. But where can you go for more help? This unit identifies free and fee services available to you.

### What You Should Be Able To Do

After completing this unit, you should be able to:

- Identify and describe the IBM resources available to assist in problem determination.
- Describe online tools available for information and problem determination.

### How You Will Check Your Progress

- Checkpoints

### References

- *OS/2 2.1 Information and Planning Guide* contains extensive information about books, conferences and other resources.
- *Installation Guide*, Appendix B, Diagnosing System Problems
- *OS/2 2.1 Using the Operating System*,  
Chapter 24, Solving problems  
Chapter 25, System Performance Considerations  
Chapter 26, Software Support  
Chapter 27, Video Support  
Chapter 28, Printer Support  
Chapter 29, Hardware Support

## OS/2 Direct Support

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- 1-800-992-4777
- 60 days free support
- Must have valid registration number
- Live call, 8:00 AM – 5:00 PM, all time zones
  - Call back for off-hour calls
- Defect reports

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### Notes:

Use online and hard copy documentation as the first source for solving problems. If you need further assistance with installation, set-up or operation of OS/2, contact IBM at this number, 1-800-992-4777. Your registration number is inside the *Using the Operating System* book shipped with OS/2 2.1.

Use forms in *Using the Operating System*, Appendix G, to aid in reporting problems.

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## OS/2 Electronic Support

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- TalkLink: IBM OS/2 Bulletin Board
- IBM PCC Bulletin Board
- CompuServe
  - Information 1-800-848-8199
  - "GO OS2SUP" at ! prompt
- IBM4FAX

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### Notes:

IBM Personal Computer Company Bulletin Board System (PCC BBS), formerly the National Support Center BBS, provides no-fee electronic access to device drivers information, Applets, and other users. OS/2 application and hardware compatibility information is also available. Service is available 24 hours a day, on a toll-call basis, with no access charge, to anyone in the world who has a modem, asynchronous-communication software with XMODEM file-transfer protocols, and a switched telephone line. (The modem should be set for 8 data bits, 1 stop bit, no parity, and the standard transmission speed from 1200 to 9600 baud.) To access the PCC BBS, call 1-919-517-0001.

One of the most active arenas of OS/2 support is on the CompuServe Information Service. IBM sponsors five forums on CompuServe, two specifically for developers. The developer's forums are OS2DF1 and OS2DF2 (for OS/2 Developers Forums 1 and 2). Type **GO OS2DF1** or **GO OS2DF2** to get to these forums. If you want to browse the other OS/2 forums, they are OS2USER, OS2SUPP (support), and OS2BETA. Typing **GO IBMOS2** takes you to a main menu from which you can access the other forums.



## TalkLink

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- Conferences and Forums
- User-to-User Messaging
- Support
- Software Library
- News and Announcements
- Search Service

---

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### Notes:

TalkLink is IBM's electronic conferencing service. Users can converse electronically with each other and with the worldwide IBM community on a wide variety of topics. TalkLink provides the above capabilities for users to review information electronically, submit questions and requests, and receive answers and information.

TalkLink is an umbrella service, within which other services exist. One service of specific interest to OS/2 developers is the OS/2 Bulletin Board (OS/2 BBS).

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## IBM OS/2 BBS

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- OS/2 General Question and Answer
- OS/2 Arena – General Discussions, Debates, and Speculation
- OS/2 and Presentation Manager Programming
- IBM WorkFrame/2
- IBM Developer's Toolkit for OS/2
- IBM C Set Compiler
- REXX Programming

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**Notes:**

In addition to the OS/2 BBS, there are TalkLink bulletin boards devoted to DOS, network systems, and many other topics. These bulletin boards provide a similar level of information on their respective topics.

For information on registration, fees, and how to access TalkLink and the OS/2 BBS, call 1-800-547-1283 (voice).

An access package is provided which allows connection to an IBM host system where information is shared between IBM development, IBM support services, and customers.

## Obtaining Device Drivers

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- Shipped with OS/2
- Supplied with hardware
- Obtained electronically
  - PCC Bulletin Board

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### Notes:

The PCC BBS allows direct user access to the device-driver file sections. The PCC Bulletin Board contains the OS/2 device drivers in a format suitable for downloading. Each device driver downloaded comes with its own Terms and Conditions, either from IBM or the hardware vendor. Information regarding the installation of OS/2 device drivers is contained in the OS/2 product documentation.

Selected device drivers for non-IBM hardware devices may also be available from the NSC BBS as a convenience to IBM customers. These device drivers are obtained by IBM from the hardware developers who remain responsible for their own distribution of OS/2 device drivers for their hardware devices. IBM will not guarantee the compatibility or functionality of the non-IBM device drivers or hardware devices. You should contact the hardware developer directly about the suitability of the drivers for your equipment and requirements.

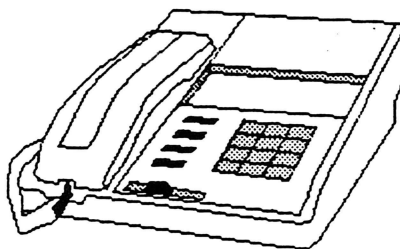
IBM and non-IBM OS/2 device drivers are available from IBM without charge. However, you are responsible for all telephone toll charges incurred when electronically downloading the drivers. In addition to the requirements given on page 9.3 for asynchronous electronic connection to the NSC BBS, you must have communication software capable of supporting XMODEM file-transfer protocols.

**Supplemental Distribution:** If you do not have the required modem for electronic distribution and you cannot obtain an OS/2 device driver from an IBM Authorized Personal Computer Dealer Advanced Products or an Authorized Industry Remarketer-Personal Computers, you can contact your IBM Marketing Representative to obtain available OS/2 device drivers.

Direct questions regarding existing device-driver distribution to your IBM Authorized Personal Computer Dealer Advanced Products, IBM Authorized Industry remarketer-Personal Computers, or IBM Marketing Representative.

## Support Resources – Summary

- OS/2 Support Line 1-800-992-4777
- Info on IBM OS/2 BBS 1-800-547-1283
- Info on CompuServe 1-800-848-8199
- Info on Local BBS's 1-609-596-1267
- OS/2 Product Info 1-800-3IBMOS2
- Personal Computer Co. Bulletin Board 1-919-517-0001
- Information Extracts 1-800-IBM4FAX
- National Support Center 1-800-IBMPROD



(604) 664-6464/6

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### Notes:

For general IBM OS/2 product information, availability, and ordering, call 1-800-3IBMOS2.

IBM PC Company or Personal Systems Programs distributors may call the National Support Center for call-back support. The number is 1-800-IBM-PROD.

### Recommended references:

- To order the *OS/2 Online Book Collection* (53G2166), call 1-800-426-7282.
- To order OS/2 IBM Redbooks, call 1-800-3IBMOS2 or call QUE publishing at 1-800-428-5331:
  - *OS/2 2.1 Redbook for Power Users*
  - *OS/2 2.1 Redbook for Developers*



## Unit 10. Advanced Installation Topics

### What This Unit is About:

You should be confident you can install OS/2 on a single system. But your customer may have hundreds of systems which need OS/2 installed. This unit introduces a method to automate responses to the choices required during installation.

### What You Should Be Able To Do

After completing this unit, you should be able to:

- Identify key directories used when supporting OS/2.
- Describe a response file.
- Describe the advantages of system installation using a response file.
- Given a customer requirement, install OS/2 using a response file.

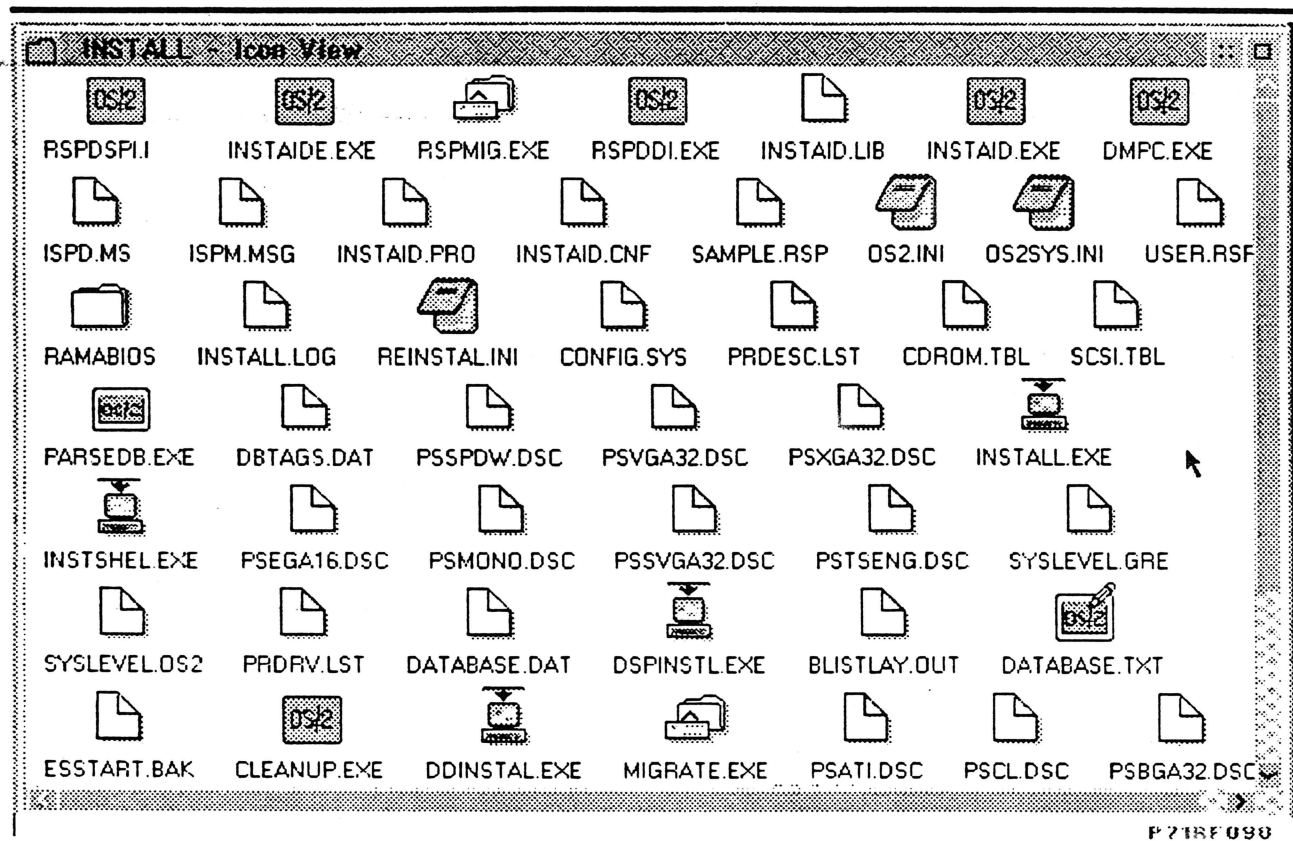
### How You Will Check Your Progress

- Apply skills in exercise.

### References

- Course G3815, Remote Software Installation Using CID, is offered by Skill Dynamics. Call 1-800-IBM-TEAC.
- *OS/2 Version 2.0 Remote Installation and Maintenance*, GG24-3780-01.
- *NTS/2 Redirected Installation and Configuration Guide*, S96F-8488.

## OS/2 Install Directory



### Notes:

The OS2\INSTALL directory contains many important files which are used by the support person. Some examples to note:

RSPINST.EXE	OS2.INI	INSTALL.LOG
USER.RSP	OS2SYS.INI	
SAMPLE.RSP	CONFIG.SYS	
PRDESC.LST	DBTAGS.DAT	ESSTART
	PARSEDB.EXE	
	DATABASE.DAT	
	DATABASE.TXT	

The CONFIG.SYS, OS2.INI and OS2SYS.INI files in this directory were saved when initial installation completed. These can be recovered if the operational versions are corrupted.

---

## DOS/WIN-OS/2 Support

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- \OS2\MDOS
  - Located on OS/2 install drive
  - COMMAND.COM
  - Virtual device drivers
  - XMS and EMS drivers
  
- \OS2\MDOS\WINOS2
  - Can be on different drive
  - WIN-OS/2 applets
  - WIN.COM
  - INI files

---

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Notes:



## OS/2 Installation Options

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	Panel	Response File
Diskette or CD-ROM	Experienced	Novice
Redirected	Advanced	Standard

---

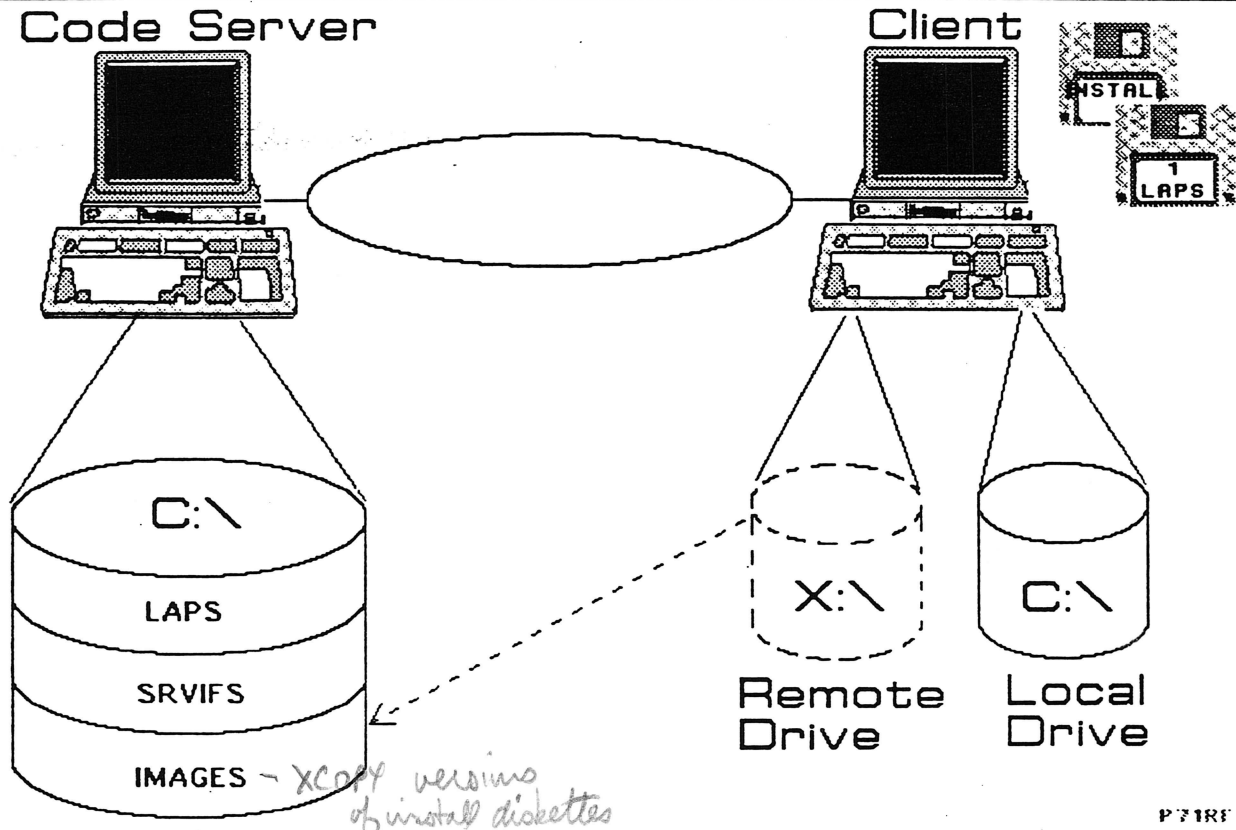
P71RF110**Notes:**

There are four modes to perform a standard OS/2 installation. The default installation is by switching diskettes on request after answering questions from the installation program. This is a panel install. OS/2 also allows the panel driven mode of installation to pull the files it requires from the redirected drive of a Code Server.

OS/2 also allows an administrator to provide the answers required by the installation program in a flat ASCII file called a response file. This method can be used with diskettes as well as via redirected drive of a Code Server.

# Redirected Install

## Code Server



P71RF120

### Notes:

**CID** - Configuration, Installation, Distribution - is an architecture for automated workstation management. A CID product used to create a "Code Server" is NTS/2 (Network Transport Service/2). NTS/2 is used to install OS/2 and applications such as Communications Manager/2 and OS/2 LAN Server. Components of NTS/2 used to install OS/2 are LAPS and SRVIFS.

**LAPS** - LAN Adapter and Protocol Support - also called "thin LAN transport" or "thin client", is packed with NTS/2 and may also be installed using NTS/2.

**SRVIFS** - Service Installable File System - provides redirected access to diskette images for the install process. - "thin IFS" for client as well.

## Response File

```
*****
*
* FormatPartition
*
* Specifies whether or not to format the install
* partition
*
* Valid Params:
*
* 0=Do not format (DEFAULT)
* 1=Format
*
*****
FormatPartition=0
```

- A response file is an editable ASCII file
- Sample response file is  
    \OS2\INSTALL\SAMPLE.RSP

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### Notes:

Response files allow administrators to setup a "no questions asked" installation process for end-users. Response files are flat ASCII files which contain keywords and values. These are the answers to the questions posed by the panel driven installation process. A special installation program parses the ASCII file and proceeds with the installation as if an end-user had actually answered the questions.

The sample response file, \OS2\INSTALL\SAMPLE.RSP, contains comments explaining all of the parameters in the response file. The SAMPLE.RSP file contains defaults for all the keywords which are used if the keyword is missing or the value is in error.

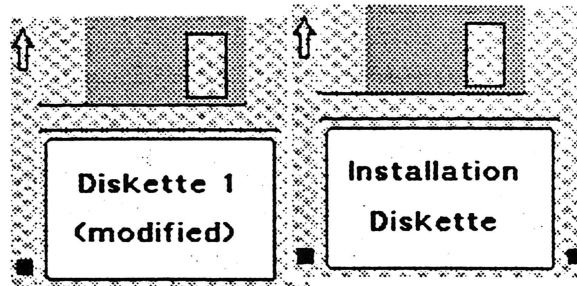
When a user does answer the panels for a panel driven installation, those answers are recorded in a response file in the \OS2\INSTALL directory named USER.RSP.

To generate a new response file, you can copy the sample response file and change the parameters as needed. The response file can be placed on the code server or it can be placed on Diskette 1. To save space so that this file will fit on Diskette 1, you may also remove the comments (lines beginning with "\*").

---

## Response File Procedure

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- Edit response file for your installation
- Copy the response file to the Diskette [#1]
- Proceed with installation, using modified Diskette #1 for response file install

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### Notes:

## Exercise 10.1 Install OS/2 Using a Response File

### What This Exercise is About

An alternative method of OS/2 system installation is *response file installation*. The response file allows for unattended installation of OS/2 from diskette, diskette images on an alternative medium (i.e., hard file), or from a code server on the Local Area Network.

You will apply the skills taught in this class to plan an installation based upon a set of customer requirements. Once you have planned the installation, you will create a response file that meets the criteria of your customer's requirements. Finally, you will install the OS/2 system to meet your customer's requirements.

### What You Should Be Able To Do

After completing this exercise you should be able to:

- Plan an OS/2 installation to meet a given set of customer requirements.
- Create a response file for a given customer requirement.
- Install OS/2 from a code server using a response file.

## Customer Requirements

Remember those 20 machines that you configured for those twenty secretaries? Based upon the success of your pilot installation, the customer has decided to give those same twenty machines to a group of programmers. The machine configuration requirements are different for the programmers than they were for the secretaries.

The programmers will be using OS/2 to perform their day-to-day business functions. However, since they will be writing code, they need to establish a test environment independent of their production code. This test environment will also utilize OS/2 Version 2.1, but must be insulated from the production environment, so that their production code will be secure from errant tests. However, the existing C: drive may contain some applications and data files that must be accessible regardless of which copy of OS/2 the machine is booted from. The programmer must also have a small 5MB partition so that they may boot native DOS in the event the situation warrants it. As a result, the programmer must be able to boot the machine in three different environments—Production OS/2, Test OS/2, and native DOS.

In the test environment, the programmers will need all ATM font support for OS/2 and Windows. Since the test environment, by definition, will not be stable, the programmers want to be able to automatically back up their \*.INI files automatically, so that their desktop settings may be restored if necessary. Also, in order to enhance their productivity, the programmers would like to start all of their Windows applications from the OS/2 desktop. Since they will be doing code development, the programmers want to have the following OS/2 tools available:

- REXX documentation
- REXX support
- DOS and WIN-OS/2 support
- Seek and Scan Tool
- Printer (4019 LaserPrinter E or your attached printer)
- OS/2 Command Reference

The customer also has stated the initial swap file size must be at least 10MB. Additional applications and data files must be stored on the system. As a result, any additional disk space is to be formatted as a logical drive to contain the applications and data files. In order to allow for additional disk space, the drive that contains the Operating System must be no larger than 30 MB.

**After your discussion with the customer, you created a checklist of the customer requirements, as you understood them. The checklist follows:**

- \_\_\_ 1. Existing C: and D: partitions cannot be deleted or resized. The information in these partitions will be preserved, and the OS/2 operating system in the existing C: partition will be used, as is, as the programmers' productivity system.
- \_\_\_ 2. The customer needs a 10 MB swap file.
- \_\_\_ 3. A bootable copy of OS/2 must be placed in another logical drive or partition for test purposes. The programmer must be able to boot from this partition when he or she desires to test new code. Any application files that were placed on the productivity C: partition must still be accessible in the test environment.
- \_\_\_ 4. A bootable 5 MB DOS partition must be created. This partition must be shielded from the effects of any of the other operating system partitions.
- \_\_\_ 5. The programmer must be able to select the appropriate Operating System environment every time the machine is started.
- \_\_\_ 6. In the test environment, the programmer will need ATM font support for OS/2 and WIN-OS/2 sessions.
- \_\_\_ 7. The desktop settings must be automatically backed up every time the test environment operating system is started.
- \_\_\_ 8. Windows applications must start from the OS/2 desktop.
- \_\_\_ 9. Hard disk space is limited. The new OS/2 test partition may not be greater than 30 MB in size.
- \_\_\_ 10. In the test environment, the programmers require the following components:
  - \_\_\_ DOS and WIN-OS/2 support
  - \_\_\_ REXX support
  - \_\_\_ Seek and Scan tool
  - \_\_\_ Printer - IBM LaserPrinter E or your attached printer
  - \_\_\_ OS/2 Command Reference.
- \_\_\_ 11. Any additional disk space is to be used as a partition to store application programs, data files, etc.

## Plan the Installation.

Before beginning the installation, planning must be done. Complete the following charts to determine the configuration of the programmers' hard disk.

<u>Component</u>	<u>Required Disk Space</u>	<u>Install Drive</u>	<u>Drive Type</u>	<u>(Primary or Logical)</u>
Existing (Productivity) OS/2 2.1	30 MB	C:		Primary
-Swapper	10 MB	D:		Logical
-WIN-OS/2	9 MB	D:		Logical
Test OS/2 2.1	?	?		?
DOS 5.0	5 MB	?		?
Boot Manager	1 MB	-		Primary

You must also calculate the amount of disk space required by the Test OS/2 system required components, and decide upon which partition to install the components. Complete the following chart, to determine the amount of disk space required, and the appropriate drive on which to install the component. Use Table 3 in Appendix E to determine required space for optional features.

<u>Component</u>	<u>Required Space(KB)</u>	<u>Drive</u>
Base OS/2 Operating System		
WIN-OS/2 Support		
OS/2 DOS Support		
REXX Support		
Seek and Scan Tool		
Printer		
OS/2 Command Reference		
Swapper File		



Were you able to fit all of the test environment requirements on a single partition or logical drive? \_\_\_\_\_

If not, which components are to be placed on another partition or logical drive?

\_\_\_\_\_

\_\_\_\_\_

On which partition or logical drive did you place these extra components?

\_\_\_\_\_

\_\_\_\_\_

Before beginning with the next step, review your plans and the answers to these questions with your instructor.

## Create the Response File.

Since you will be installing OS/2 on multiple machines, you will use an unattended installation of OS/2 from a code server. In order to do this, you will need to create a response file that contains all of the parameters that OS/2 Version 2.1 needs for its installation.

- \_\_\_\_ 1. Appendix A contains a copy of the response file (SAMPLE.RSP), which includes description of each parameter. Use this reference to complete values in the response file listed on the next page.

### NOTES:

When completing the response file, ensure that the following values are set:  
**ExitOnError=0 and RebootRequired=0**

Look up the desired printer code in the **PRDESC.LST** file in Appendix A, page xxxiii.

If you decide to put the swap file on other than your OS/2 boot drive, you must modify the **ConfigSysLine** parameter.

- \_\_\_\_ 2. Once you have completed the response file planning, open **USER.RSP** file located in OS2\INSTALL.
- \_\_\_\_ 3. Modify the file to create a response file to fulfill your customer's requirements. Refer to your planning chart as you complete the response file.
- \_\_\_\_ 4. Save the modified response file as **D:\DEFAULT.RSP**.

## Install the Operating System

## USER Response File Changes

AlternateAdapter=0  
APM=0  
BaseFileSystem=?  
CDROM=  
SCSI=  
CountryCode=001  
CountryKeyboard=US  
DefaultPrinter=?  
DiagnosticAids=?  
DisplayAdapter=0  
Documentation=?  
DOSSupport=?  
WIN-OS/2Support=?  
WindowedWIN-OS/2=?  
\*WIN-OS/2Desktop=0  
\*ExistingWindowsPath=  
\*ShareDesktopConfigFiles=1  
DPML=1  
ExitOnError=0  
Fonts=?  
FormatPartition=?  
MigrateConfigFiles=0  
\*MigrateApplications=  
MoreBitmaps=?  
Mouse=1  
MousePort=0  
OptionalFileSystem=?  
OptionalSystemUtilities=?  
PCMCIA=0  
PrimaryCodePage=1  
PrinterPort=1  
ProcessEnvironment=1  
ProgressIndication=1  
RebootRequired=0  
REXX=?  
SerialDeviceSupport=?  
SourcePath=X:\IMG\OS2V20  
TargetDrive=?  
WIN-OS/2TargetDrive=?  
ToolsAndGames=?  
ConfigSysLine=?

\*This will be A:\ if you are using diskettes.

## Install the Operating System

One possible target drive for the install is the drive E: Test OS/2 created in exercise 3.1. You could have chosen to install OS/2 in another partition. If the latter is true, you must configure Boot Manager to point to the install partition.

- \_\_\_\_ 1.      Boot the machine with your OS/2 Installation Diskette. Insert the OS/2 **Response File Diskette #1** in drive A: when prompted and press **Enter**. System installation will now begin.

Did you receive any prompts during the system installation?

\_\_\_\_\_

Why or why not?

\_\_\_\_\_

\_\_\_\_\_

- \_\_\_\_ 2.      When the installation completes, reboot and make any other changes required by your customer.
- \_\_\_\_ 3.      When complete, signal the instructor to have your results validated.



## Appendix A: Unit 10 Exercise Aids

There are five sections in this Appendix:

Section 1 -- The contents of a a SAMPLE.RSP file

Section 2 -- The contents of USER.RSP file

Section 3 -- The contents of a CONFIG.SYS file for Response File Install

Section 4 -- The contents of a CONFIG.SYS file for Panel Install

Section 5 -- The contents of a PRDESC.LST file



## Section 1 -- SAMPLE.RSP File

The following 22 pages contain the contents of a SAMPLE.RSP file. The file can also be found in the C:\OS\INSTALL subdirectory of OS/2 2.1.



```
*****
* Advance Power Management                                     *
*   Specifies whether or not to install APM.                 *
*   Valid Params:                                           *
*       0=Don't install                                     *
*       1=Autodetect (DEFAULT)                             *
*       2=Install                                           *
*****
```

APM=1

```
*****
* AlternateAdapter                                           *
*   Specifies secondary adapter for two display systems.    *
*   This should be a lower or equal resolution display since *
*   the highest resolution display will be primary for PM.  *
*   Valid Params:                                           *
*       0=None (DEFAULT)                                    *
*       1=Other than following (DDINSTAL will handle)      *
*       2=Monochrome/Printer Adapter                       *
*       3=Color Graphics Adapter                           *
*       4=Enhanced Graphics Adapter                        *
*       5=PS/2 Display Adapter                             *
*       6=Video Graphics Adapter                           *
*       7=8514/A Adapter                                   *
*       8=XGA Adapter                                       *
*       9=SVGA Adapter                                       *
*****
```

AlternateAdapter=0

```
*****
* BaseFileSystem                                             *
*   Specifies which file system should be used to format    *
*   the install partition                                    *
*   Valid Params:                                           *
*       1=HPFS (DEFAULT)                                    *
*       2=FAT                                                *
*****
```

BaseFileSystem=1

```

*****
*
* CDROM
*
* Specifies which, if any, CD ROM devices you wish to
* install support for.
*
* Valid Parms:
*
* 0 = None
* 1 = Autodetect
* 2=CDTechnology T3301
* 3=HitachiCDR-1650,1750,3650
* 4=HitachiCDR-3750
* 5=IBMCD-ROM I
* 6=IBMCD-ROM II
* 7=NEC25,36,37,72,73,74,82,83,84
* 8=NECMultiSpin 38,74,84
* 9=PanasonicCR-501,LK-MC501S
* 10=PioneerDRM-600
* 11=PioneerDRM-604X
* 12=SonyCDU-541,561,6211,7211
* 13=SonyCDU-6111
* 14=TexelDM-3021,5021
* 15=TexelDM-3024,5024
* 16=Toshiba3201
* 17=Toshiba3301,3401
* 18=OTHER
*
* NOTE: Autodetection is enabled only when all scsi
* device drivers are loaded.
*****

```

CDROM=0

```

*****
*
* CountryCode
*
* Specifies which country should be installed. This
* causes all country information to be installed.
*
* Valid Parms:
*
* 3 digit country code (DEFAULT shipped version)
*
*****

```

CountryCode=001

```
*****
*
* CountryKeyboard
*
* Specifies which country keyboard should be installed.
* This causes all keyboard information to be installed.
*
* Valid Params:
*
* 2-5 character keyboard code (DEFAULT="US")
*
*****
```

CountryKeyboard=US

```
*****
*
* DefaultPrinter
*
* Specifies which default printer to install
*
* Valid Params:
*
* 0=None
* or
*
* Keyvalue=printer driver index (DEFAULT=line # of
* 42XX) in PRDESC.LST shipped on first printer diskette*
*
* NOTE: the driver index is the same as the line
* number in the ASCII PRDESC.LST file that
* the desired printer name appears on
*
*****
```

DefaultPrinter=0

```
*****
*
* DiagnosticAids
*
* Specifies whether or not to install certain RAS
* utilities.
*
* Valid Params:
*
* 0=Don't install
* 1=Install (DEFAULT)
*
*****
```

DiagnosticAids=1

```

*****
*
* DisplayAdapter
*
* Specifies which adapter should override the primary
* adapter detected by the install process
*
* Valid Parms:
*
* 0=Accept as correct (DEFAULT)
* 1=Other than following (DDINSTAL will handle)
* 2=Color Graphics Adapter
* 3=Enhanced Graphics Adapter
* 4=Video Graphics Adapter
* 5=8514/A Adapter
* 6=XGA Adapter
* 7=SVGA Adapter
*
*****

```

DisplayAdapter=0

```

*****
*
* Documentation
*
* Specifies which documentation should be installed
*
* Valid Parms:
*
* 0=None
* 1=All (DEFAULT)
* 2=OS/2 Command Reference
* 3=OS/2 Tutorial
* 4=Rexx Documentation
*
*****

```

Documentation=1

```

*****
*
* DOSSupport
*
* Specifies whether or not to install DOS Box.
*
* Valid Parms:
*
* 0=Don't install DOS
* 1=Install DOS (DEFAULT)
*
*****

```

DOSSupport=1

```
*****
*
* WIN-OS/2Support
*
* Specifies whether or not to install WIN-OS/2
* Environment. If do, select WIN-OS/2 groups or
* other components. This option is valid only
* when option 1 (DOSSupport) is selected for
* the DOSSupport keyvalue.
*
* Valid Params:
*
* 0=Do NOT install WIN-OS/2
* — Followings INSTALL WIN-OS/2 ————— *
* 1=All available groups and components (DEFAULT)
* 2=WIN-OS/2 Readme File
* 3=WIN-OS/2 Accessories Group
* 4=WIN-OS/2 Screen Save Utility
* 5=WIN-OS/2 Sound Utility
* 6=WIN-OS/2 Main and Startup Group ONLY (Minimum support)
*
* Note:
* * WIN-OS/2 Main Group and StartUp Group will be
* installed mandatorily when WIN-OS/2 supported
* ( case 1,2,3,4,5 ).
* * Case 6 is minimum WIN-OS/2 support.
*
* Example:
*
* WIN-OS/2Support=3,4
* would install WIN-OS/2 Main Group, StartUp Group and
* WIN-OS/2 Accessories and Screen Save Utility.
*
*****
```

WIN-OS/2Support=1

```
*****
*
* WindowedWIN-OS/2
*
* Specifies whether Windows** applications should run in
* windowed sessions on the Presentation Manager desktop
* or in Full Screen sessions. This option is valid only
* when option 1 (WIN-OS/2 Support) is selected for the
* DOSSupport keyvalue.
*
* Valid Params:
*
* 0=Windowed WIN-OS/2 sessions
* 1=Full Screen WIN-OS/2 sessions
*
*****
```

\*WindowedWIN-OS/2=1

```

*****
*
* WIN-OS/2Desktop
*
* Specifies what the WIN-OS/2 desktop should look like.
* This option is valid only when option 1 (WIN-OS/2
* Support) is selected for the DOSSupport keyvalue.
* Option 1 should be selected only if Windows** currently
* exists (two related options follow this one).
* Option 2 should be selected only if WIN-OS/2 has
* previously been installed.
*
* Valid Parms:
*
* 0=Install standard WIN-OS/2 desktop (DEFAULT)
* 1=Copy existing Windows** desktop and use as the
* WIN-OS/2 desktop (two related options follow)
* 2=Preserve WIN-OS/2 desktop currently installed
*
*****

```

\*WIN-OS/2Desktop=0

```

*****
*
* ExistingWindowsPath
*
* Specifies the path to an existing Windows** system.
* This option is valid only when option 1 is selected
* for the WIN-OS/2Desktop keyvalue.
*
* Valid Parms:
*
* A string that specifies the path to the existing
* Windows** system (Example: C:\WINDOWS)
*
*****

```

\*ExistingWindowsPath=

```

*****
*
* ShareDesktopConfigFiles
*
* Specifies that the desktop configuration files should
* be shared between an existing Windows** system and the
* WIN-OS/2 system being installed. If this option is
* selected, the Windows** desktop will be updated when
* changes are made to the WIN-OS/2 desktop. This
* option is valid only when option 1 is selected for the
* WIN-OS/2Desktop keyvalue.
*
*****

```

```
*
* Valid Params:
*
* 0=Do not share the Windows** desktop configuration
* files
* 1=Share the Windows** desktop configuration files
*
*****

*ShareDesktopConfigFiles=1

*****
*
* DPMI
*
* Specifies which DPMI options to install.
*
* Valid Params:
*
* 0=none
* 1=All (DEFAULT)
* 2=Virtual DOS Protect Mode Interface
* 3=Virtual Expanded Memory Management
* 4=Virtual Extended Memory Support
*
*****

DPMI=1

*****
*
* ExitOnError
*
* Specifies if the install program should exit with an
* error code if an error occurs. This also determines
* whether the installation process will exit with a return*
* code when it completes rather than the C-A-D panel.
*
* Valid Params:
*
* 0 = Do not exit when error occurs; display panel
* (DEFAULT)
* 1 = Exit quietly with a return code
*
*****

ExitOnError=0
```

```

*****
*
* Fonts
*
* Specifies which fonts should be installed
*
* Valid Params:
*
* 0 = None
* 1 = All (DEFAULT)
* 2 = Courier (Bitmap)
* 3 = Helvetica (Bitmap)
* 4 = System Mono-spaced (Bitmap)
* 5 = Times Roman (Bitmap)
* 6 = Courier (Outline)
* 7 = Helvetica (Outline)
* 8 = Times New Roman (Outline)
*
*****

```

Fonts=1

```

*****
*
* FormatPartition
*
* Specifies whether or not to format the install
* partition
*
* Valid Params:
*
* 0=Do not format (DEFAULT)
* 1=Format
*
*****

```

FormatPartition=0

```

*****
*
* Include
*
* For a description of the function of this keyword,
* see IncludeAtEnd which is functionally equivalent
* to this keyword.
*
* Valid Params:
*
* KEYWORD = valid filename
*
*****

```

\* Include=include.rsp



```

*****
*
* IncludeAtEnd
*
* Specifies another response file to process along
* with the current one. There may be multiple
* occurrences of this keyword. The "included"
* response file is appended to the end of all
* response files that have been processed before
* this one.
*
* eg.
* File1.RSP
* +-----+
* | IncludeAtEnd=File2.RSP |
* | IncludeAtEnd=File4.RSP |
* | Mouse=1                |
* +-----+
* File2.RSP
* +-----+
* | IncludeAtEnd=File3.RSP |
* | Mouse=2                |
* +-----+
* File3.RSP
* +-----+
* | Mouse=3                |
* +-----+
* File4.RSP
* +-----+
* | Mouse=4                |
* +-----+
*
* No validity checking is done.
*
* Valid Params:
*
* KEYWORD = valid filename
*****

```

```

* IncludeAtEnd=atend.rsp

```

```

*****
*
* IncludeInLine
*
* Specifies another response file to process along
* with the current one. There may be multiple
* occurrences of this keyword. The "included"
* response file is processed immediately when the
* keyword is found.
*
* No validity checking is done.
*

```

```

*
* eg.
*   File1.RSP                               Processing
*   +-----+
*   | IncludeInLine=File2.RSP |           Mouse=3
*   | IncludeInLine=File4.RSP |           Mouse=2
*   | Mouse=1                  |           Mouse=4
*   +-----+                               Mouse=1
*   File2.RSP
*   +-----+
*   | IncludeInLine=File3.RSP |
*   | Mouse=2                  |
*   +-----+
*   File3.RSP
*   +-----+
*   | Mouse=3                  |
*   +-----+
*   File4.RSP
*   +-----+
*   | Mouse=4                  |
*   +-----+
*
* Valid Parms:
*
*   KEYWORD = valid filename
*
*****

* IncludeInLine=inline.rsp

*****
*
* MigrateConfigFiles
*
*   Specifies whether or not to migrate configuration files
*   from a previous release of the operating system.
*
*   Valid Parms:
*
*       0=Don't migrate
*       1=Migrate files (DEFAULT)
*
*****

MigrateConfigFiles=1

*****
*
* MigrateApplications
*
*   Specifies whether or not to migrate existing DOS,
*   Windows** and OS/2 applications. Only those
*   applications listed in the database specified will
*   be migrated.
*
*

```

```
* Valid Params: *
*
* Drives to search, database to use for search *
* (Example: C:D:,C:\OS2\INSTALL\DATABASE.DAT) *
* *
*****
```

\*MigrateApplications=

```
*****
* *
* MoreBitmaps *
* *
* Specifies whether or not to install more bitmaps. *
* *
* Valid Params: *
* *
* 0=Don't install More Bitmaps *
* 1=Install More Bitmaps (DEFAULT) *
* *
*****
```

MoreBitmaps=1

```
*****
* *
* Mouse *
* *
* Specifies which mouse device driver, if any, to *
* install *
* *
* Valid Params: *
* *
* 0 = No pointing device support *
* 1 = PS/2 Style Pointing Devicee (DEFAULT) *
* 2 = Bus Version *
* 3 = Serial Version *
* 4 = InPort Version *
* 5 = Logitech (tm) 'C' Series Serial Mouse *
* 6 = IBM PS/2 Touch Display *
* 7 = Logitech 'M' Series Mouse *
* 8 = PC Mouse Systems (tm) Mouse *
* 9 = Other Pointing Device for Mouse Port *
* *
*****
```

Mouse=1

```
*****
* *
* MousePort *
* *
* Specifies to which port a serial-type mouse should *
* be attatched (valid for serial or Logitech(tm) mice) *
* *
*****
```

```
*      Valid Params:
*
*      0 = No port necessary (DEFAULT)
*      1 = COM1
*      2 = COM2
*      3 = COM3
*      4 = COM4
*
*****
```

MousePort=0

```
*****
*
* OptionalFileSystem
*
* Specifies whether or not to install optional file
* system(s) i.e. HPFS
*
* Valid Params:
*
*      0=Do Not Install Optional File System(s)
*      1=Install Optional File System (DEFAULT)
*
*****
```

OptionalFileSystem=1

```
*****
*
* OptionalSystemUtilities
*
* Specifies whether or not to install the following
* system utilities.
*
* Valid Params:
*
*      0=Install none
*      1=Install all (DEFAULT)
*      2=Backup Hard Disk
*      3=Change File Attributes
*      4=Display Directory Tree
*      5=Manage Partitions
*      6=Label Diskettes
*      7=Link Object Modules
*      8=Picture Utilities
*      9=PMREXX
*      10=Recover Files
*      11=Restore Backed-up Files
*      12=Sort Filter
*      13=Installation Aid
*
```

```

*
* Example:
*      OptionalSystemUtilities=2,9,4
*      would install Backup, PMREXX and Tree utilities.
*
*****

```

OptionalSystemUtilities=1

```

*****
*
* OS2IniData
*
* Specifies a profile string to be written to the
* user configuration file OS2.INI. There may be
* multiple occurrences of this keyword.
*
* Valid Params:
*
*      KEYWORD = /AppName/KeyName/KeyValue/
*
*      NOTE: Since each of these names can contain
*      imbedded blanks and whitespace, the "slash"
*      character must be used as a delimiter. There
*      must be three tokens delineated on all sides or
*      this keyword will be ignored.
*
*****

```

OS2IniData=/AppName/KeyName/KeyValue/

```

*****
*
* PCMCIA
*
* Specifies whether or not to install PCMCIA.
*
* Valid Params:
*
*      0=Don't install
*      1=Install (DEFAULT)
*
*****

```

PCMCIA=1

```

*****
*
* PrimaryCodePage
*
* Specifies whether "national" or "multi-lingual" code
* page is primary (first active code page before
* switching).
*

```

```

*      Valid Params:
*
*      1=National (DEFAULT)
*      2=Multilingual
*
*****

```

PrimaryCodePage=1

```

*****
*
* PrinterPort
*
* Specifies to which printer port the default printer
* should be attached
*
* Valid Params:
*
*      1=LPT1 (DEFAULT)
*      2=LPT2
*      3=LPT3
*      4=COM1
*      5=COM2
*      6=COM3
*      7=COM4
*
*****

```

PrinterPort=1

```

*****
*
* ProcessEnvironment
*
* Each of the Keyword/Keyvalue statements specified in
* this response file may be added to the environment as
* environment variables.
* This makes it possible for user programs, batch files,
* etc. (UserExit) to access response file settings.
*
* Valid Params:
*
*      0 = Do not add keyword/keyvalue statements specified
*          in this response file to environment.
*      1 = Add all keyword/keyvalue statements specified
*          in this response file to environment (DEFAULT).
*
*****

```

ProcessEnvironment=1

```
*****
*
* ProgressIndication
*
* Specifies whether or not to display progress indicators
* during the installation. Disabling this will allow a
* frontend program to display something else while we do
* our job in an unattended environment.
*
* Valid Params:
*
* 0 = No progress indication
* 1 = Progress indication (DEFAULT)
*
*****
```

ProgressIndication=1

```
*****
*
* RebootRequired
*
* Specifies if the machine should be automatically
* warm booted when installation is complete. This is
* ignored if the ExtendedInstall response is specified.
*
* Valid Params:
*
* 0=Ask user to reboot (DEFAULT)
* 1=Auto-reboot
*
*****
```

RebootRequired=0

```
*****
*
* REXX
*
* Specifies whether or not to install REXX
*
* Valid Params:
*
* 0=Don't Install REXX
* 1=Install REXX (DEFAULT)
*
*****
```

REXX=1

```
*****
*
* SCSI
*
* Specifies which, if any, CD ROM adapter support you
* wish to install support for.
*
* Valid Params:
*
* 0 = None
* 1 = Autodetect
* 2=Adaptec1510, 1520, 1522
* 3=Adaptec1540, 1542
* 4=Adaptec1640
* 5=Adaptec1740, 1742, 1744
* 6=DPTPM2011, PM2012
* 7=FutureDomain 845,850,850IBM,860,875,885
* 8=FutureDomain 1650,1660,1670,1680,MCS700
* 9=FutureDomain 7000EX
* 10=IBMPS/2 SCSI Adapter
* 11=IBM16-Bit AT Fast SCSI Adapter
*
*****
```

SCSI=1

```
*****
*
* SerialDeviceSupport
*
* Specifies whether or not to install the serial
* device driver.
*
* Valid Params:
*
* 0=Don't install
* 1=Install (DEFAULT)
*
*****
```

SerialDeviceSupport=1



```
*****
*
* SourcePath
*
* Specifies a single media (no disk switching) that should*
* be used as a source drive and directory from which to *
* install.
*
* Valid Params:
*
* KEYVALUE=drive and optional path (D:\OS2SE20\...)
* DEFAULT=A:\
*
*****
```

\* SourcePath=D:\os2se20

```
*****
*
* TargetDrive
*
* Specifies the target drive to which OS/2 should be
* installed. This drive is assumed to be a valid
* partition. If a partition other than C: is specified,
* it is assumed that MOST support is already installed to
* enable booting an operating system from any partition.
*
* Valid Params:
*
* KEYVALUE=d:
*
* where "d:" is a valid partition that OS/2 may be
* installed to.
* DEFAULT=first acceptable partition
*
*****
```

TargetDrive=C:

```
*****
*
* WIN-OS/2TargetDrive
*
* Specifies which valid partition drive to install
* WIN-OS/2.
*
* Valid Params: any valid FORMATTED partition.
*
* C: (DEFAULT)
* D:
* .
* .
*
* Z:
```

```
*
* Example:
*
*   WIN-OS/2TargetDrive=D:
*   would install WIN-OS/2 to partition D: located in
*   \OS2\MDOS\WINOS2
*
*****

*WIN-OS/2TargetDrive=C:

*****
*
*   ToolsAndGames
*
*   Specifies whether or not to install tools and games
*   such as editors and jigsaw.
*
*   Valid Params:
*
*   0=Install none
*   1=Install all (DEFAULT)
*   2=Enhanced Editor
*   3=Search and Scan Tool
*   4=Terminal Emulator
*   5=Chart Maker
*   6=Personal Productivity
*   7=Solitaire - Klondike
*   8=Reversi
*   9=Scramble
*   10=Cat and Mouse
*   11=Pulse
*   12=Jigsaw
*   13=Chess
*
* Example:
*
*   ToolsAndGames=2,8,13
*   would install the Enhanced Editor, Reversi and
*   Chess.
*
*****

ToolsAndGames=1
```

```
*****
*
* ConfigSysLine
*
* Specifies a text line to be appended to CONFIG.SYS.
* There may be multiple occurrences of this keyword.
* No validity checking is done.
*
* Valid Params:
*
* KEYWORD = a valid CONFIG.SYS statement
*
*****
```

\* ConfigSysLine=REM This is a CONFIG.SYS remark line.

```
*****
*
* Copy
*
* Specifies a source file and destination directory
* of a file to be copied during install. Errors are
* ignored, though they will be logged. Packed files
* are acceptable since UNPACK will do the copy.
* There may be multiple occurrences of this keyword.
* No validity checking is done.
*
* Valid Params:
*
* KEYWORD= source file destination
*
* where source file = valid filename
* and destination = valid directory name
*
* ex: Copy = readme.dat c:\os2
*
*****
```

\* Copy=vga c:\ /n:ini.rc

```
*****
*
* EarlyUserExit
*
* Specifies the name of a program that Install will
* DosExec after the target drive is prepared. Install
* waits for the program to return. This keyword may occur
* more than once. Each will be executed in the order that
* they appear at the end of OS/2 Install. The only
* difference between this keyword and the UserExit keyword
* is that this one is executed early in the installation
* process while the latter is executed at the very end.
*
*****
```

```

*      Valid Params:
*
*      KEYVALUE=user exit program name (DEFAULT=none)
*
*****

* EarlyUserExit=T c:\config.sys

*****

*      ExtendedInstall
*
*      Specifies program to be run asynchronously while SE
*      Install DosExits
*
*      Valid Params:
*
*      KEYVALUE=full pathname of program
*      (DEFAULT=none)
*
*****

* ExtendedInstall=PROGRAM.EXE

*****

*      ID
*
*      Specifies some identification string which may be
*      used by install or UserExit to identify the
*      response file(s) used for this installation
*
*      Valid Params:
*
*      KEYWORD = ASCII string
*
*****

*ID=OS2SE20 Sample Response File

*****

*      SeedConfigSysLine
*
*      Specifies a text line to be appended to the CONFIG.SYS
*      written to the seed system from which PM Install boots.
*      This will allow device drivers (that may be required) to
*      become part of that seed system.
*      There may be multiple occurrences of this keyword.
*      No validity checking is done.
*

```

```
*      Valid Params:                                *
*                                                    *
*      KEYWORD = a valid CONFIG.SYS statement        *
*                                                    *
*****

* SeedConfigSysLine=REM This is a remark line in the seed CONFIG.SYS.

*****
*
* UserExit                                           *
*                                                    *
* Specifies the name of a program that Install will *
* DosExec before exiting memory.  Install waits for the *
* program to return.  This keyword may occur more than *
* once.  Each will be executed in the order that they *
* appear at the end of OS/2 Install.                 *
*                                                    *
* Valid Params:                                     *
*                                                    *
*      KEYVALUE=user exit program name (DEFAULT=none) *
*                                                    *
*****

* UserExit=T.EXE C:\OS2\INSTALL\INSTALL.LOG

*****
*
* Version                                           *
*                                                    *
* Specifies specific version of the operating system for *
* which this file is intended.  The file can be used for *
* future versions, though some keywords may no longer *
* be valid.                                             *
*                                                    *
* Valid Params:                                     *
*                                                    *
*      KEYWORD = some version string (determined later) *
*                                                    *
*****

*Version=OS2SE20

*****
*
* DDInstall                                         *
*                                                    *
* Use OS/2 Device Driver Installation to install external *
* loadable device drivers.  A Device Driver Profile ( a *
* text file with a .DDP file name extension) must be *
* provided by the device driver author to control the *
* installation of the device driver.                  *
*                                                    *
```

```
*      Valid Params:                                     *
*      DDISrc = Directory where the .DDP files are.      *
*      DDIDest = Directory where to copy the device driver *
*                  files.                                  *
*      DDIDDP = List of .DDP files to install.            *
*                  (example: file1.DDP,file2.DDP)         *
*                                                         *
*****
*DDISrc  = Z:\DDP
*DDIDest = C:\
*DDIDDP  = *.DDP
```



## Section 2 -- USER.RSP File

This is the file built when you completed your initial installation.

```
AlternateAdapter=0
APM=0
BaseFileSystem=2
CDROM=
SCSI=
CountryCode=001
CountryKeyboard=US
DefaultPrinter=0
DiagnosticAids=1
DisplayAdapter=0
Documentation=1
DOSSupport=1
WIN-OS/2Support=1
*WindowedWIN-OS/2=1
*WIN-OS/2Desktop=0
*ExistingWindowsPath=
*ShareDesktopConfigFiles=1
DPML=1
ExitOnError=0
Fonts=1
FormatPartition=1
MigrateConfigFiles=0
*MigrateApplications=
MoreBitmaps=1
Mouse=1
MousePort=0
OptionalFileSystem=1
OptionalSystemUtilities=1
PCMCIA=0
PrimaryCodePage=1
PrinterPort=1
ProcessEnvironment=1
ProgressIndication=1
RebootRequired=0
REXX=1
SerialDeviceSupport=1
SourcePath=X:\
*WIN-OS/2TargetDrive=d:
TargetDrive=C:
ToolsAndGames=3
*ConfigSysLine=
```





## Section 3 -- CONFIG.SYS file for a Response File Install

```
buffers=32
iopl=yes
memman=noswap
protshell=sysinst1.exe
set os2_shell=cmd.exe /K A:\STARTUP.CMD
diskcache=64,LW
protectonly=yes
libpath=.;\;X:\DLL;X:\IMG\LCU;
ifs=hpfs.ifs /c:64
pauseonerror=no
codepage=850
devinfo=kbd,us,keyboard.dcp
devinfo=scr,ega,vtbl850.dcp
device=\dos.sys
set path=;\os2;\os2\system;\os2\install;A;;
set dpath=;\os2;\os2\system;\os2\install;A;;X:\DLL;X:\IMG\LCU;
set keys=on
basedev=print01.sys
basedev=ibm1flpy.add
basedev=ibm1s506.add
basedev=ibm2flpy.add
basedev=ibm2adsk.add
basedev=ibm2m57.add
basedev=ibm2scsi.add
basedev=ibmint13.i13
basedev=os2dasd.dmd
device=\testcfg.sys
device=\refpart.sys

rem *** Start of ThinLAPS additions ***
device = lanmsgdd.os2
device = protman.os2
device = netbeui.os2
device = netbios.os2
device = IBMTOK.OS2
run = netbind.exe
run = lanmsgex.exe
CALL=A:\SRVATTCH.EXE Y: server1
CALL=A:\SRVATTCH.EXE Z: \\server1\LCULOG
DEVICE=A:\SRVIFS.SYS
IFS=A:\SRVIFSC.IFS * /S:2 /A:0
CALL=A:\SRVATTCH.EXE X: \\server1\gDRIVE
RUN=X:\IMG\LCU\SRVREXX.EXE
```



## Section 4 -- CONFIG.SYS file for a Panel Install

```
buffers=32
ioopl=yes
memman=noswap
protshell=sysinst1.exe
set os2_shell=x:\img\os2v20\disk_1\sysinst2.exe x:\img\os2v20
diskcache=64,LW
protectonly=yes
libpath=.;\;X:\DLL;X:\IMG\LCU;
ifs=hpfs.ifs /c:64
pauseonerror=no
codepage=850
devinfo=kbd,us,keyboard.dcp
devinfo=scr,ega,vtbl850.dcp
device=\dos.sys
set path=\;\os2;\os2\system;\os2\install;A;;
set dpath=\;\os2;\os2\system;\os2\install;A;;X:\DLL;X:\IMG\LCU;
set keys=on
basedev=print01.sys
basedev=ibm1flpy.add
basedev=ibm1s506.add
basedev=ibm2flpy.add
basedev=ibm2adsk.add
basedev=ibm2m57.add
basedev=ibm2scsi.add
basedev=ibmint13.i13
basedev=os2dasd.dmd
device=\testcfg.sys
device=\refpart.sys

rem *** Start of ThinLAPS additions ***
device = lanmsgdd.os2
device = protman.os2
device = netbeui.os2
device = netbios.os2
device = IBMTOK.OS2
run = netbind.exe
run = lanmsgex.exe
rem CALL=A:\SRVATTCH.EXE Y: \\server1\OS2
CALL=A:\SRVATTCH.EXE Z: \\server1\LCULOG
DEVICE=A:\SRVIFS.SYS
IFS=A:\SRVIFSC.IFS * /S:2 /T /A:0
CALL=A:\SRVATTCH.EXE X: \\server1\gDRIVE
RUN=X:\IMG\LCU\SRVREXX.EXE
```



## Section 5 -- PRDESC.LST File

This file is in the OS2\INSTALL directory.

```

1   AST TurboLaser: AST TurboLaser (PSCRIPT.DRV)
2   Agfa Matrix ChromaScript v51_8: Agfa Matrix ChromaScript v51_8
   (PSCRIPT.DRV)
3   Agfa-Compugraphic 9400PS v49_3: Agfa-Compugraphic 9400PS v49_3
   (PSCRIPT.DRV)
4   Agfa/Compugraphic 400PS: Agfa/Compugraphic 400PS (PSCRIPT.DRV)
5   Apple LaserWriter: Apple LaserWriter (PSCRIPT.DRV)
6   Apple LaserWriter II NT: Apple LaserWriter II NT (PSCRIPT.DRV)
7   Apple LaserWriter II NTX: Apple LaserWriter II NTX (PSCRIPT.DRV)
8   Apple LaserWriter Plus: Apple LaserWriter Plus (PSCRIPT.DRV)
9   Apple LaserWriter Plus v42_2: Apple LaserWriter Plus v42_2 (PSCRIPT.DRV)
10  COMPAQ Pagemark 15: COMPAQ Pagemark 15 (PSCRIPT.DRV)
11  COMPAQ Pagemark 20: COMPAQ Pagemark 20 (PSCRIPT.DRV)
12  Citizen PN48: Citizen PN48 (EPSON.DRV)
13  Colormate PS v51_9: Colormate PS v51_9 (PSCRIPT.DRV)
14  Dataproducts LZR 1260 v47_0: Dataproducts LZR 1260 v47_0 (PSCRIPT.DRV)
15  Dataproducts LZR-2665: Dataproducts LZR-2665 (PSCRIPT.DRV)
16  Digital LN03R ScriptPrinter: Digital LN03R ScriptPrinter (PSCRIPT.DRV)
17  Digital LPS PrintServer 40: Digital LPS PrintServer 40 (PSCRIPT.DRV)
18  Epson 24 pins - 136 columns: 24-pin 136 Col (EPSON.DRV)
19  Epson 24 pins - 80 columns: 24-pin 80 Col (EPSON.DRV)
20  Epson 9 pins - 136 columns: 9-pin 136 Col (EPSON.DRV)
21  Epson 9 pins - 80 columns: 9-pin 80 Col (EPSON.DRV)
22  Epson AP-2250 9 pins - 80 columns: AP-2250 (EPSON.DRV)
23  Epson AP-3250 24 pins - 80 columns: AP-3250 (EPSON.DRV)
24  Epson AP-5000 24 pins - 80 columns: AP-5000 (EPSON.DRV)
25  Epson AP-5500 24 pins - 136 columns: AP-5500 (EPSON.DRV)
26  Epson ActionLaser 1000/1500: Epson ActionLaser 1000/1500 (LASERJET.DRV)
27  Epson ActionLaser II: Epson ActionLaser II (LASERJET.DRV)
28  Epson DFX-5000 9 pins - 136 columns: DFX-5000 (EPSON.DRV)
29  Epson DFX-8000 9 pin - 136 column: DFX-8000 (EPSON.DRV)
30  Epson EPL-6000 Laser: EPL-6000 (EPSON.DRV)
31  Epson EPL-7000: Epson EPL-7000 (LASERJET.DRV)
32  Epson EPL-7500 v52_3: Epson EPL-7500 v52_3 (PSCRIPT.DRV)
33  Epson EPL-8000: Epson EPL-8000 (LASERJET.DRV)
34  Epson EPL-8000 PS Card 82605: Epson EPL-8000 PS Card 82605 (PSCRIPT.DRV)
35  Epson EX-1000 Color 9 pins - 136 columns: EX-1000 (EPSON.DRV)
36  Epson EX-800 Color 9 pins - 80 columns: EX-800 (EPSON.DRV)
37  Epson FX-1050 9 pins - 136 columns: FX-1050 (EPSON.DRV)
38  Epson FX-1170 9 pins - 136 columns: FX-1170 (EPSON.DRV)
39  Epson FX-286e 9 pins - 136 columns: FX-286e (EPSON.DRV)
40  Epson FX-850 9 pins - 80 columns: FX-850 (EPSON.DRV)
41  Epson FX-870 9 pins - 80 columns: FX-870 (EPSON.DRV)
42  Epson JX-80 Color 9 pins - 80 columns: JX-80 (EPSON.DRV)
43  Epson LQ-1010 24 pin - 132 column: LQ-1010 (EPSON.DRV)
44  Epson LQ-1050 (N9) 24 pins - 136 columns: LQ-1050 (N9) (EPSON.DRV)
45  Epson LQ-1050 24 pins - 136 columns: LQ-1050 (EPSON.DRV)
46  Epson LQ-1070 24 pins - 136 columns: LQ-1070 (EPSON.DRV)
47  Epson LQ-1170 24 pins - 136 columns: LQ-1170 (EPSON.DRV)
48  Epson LQ-2500 Color 24 pins - 136 columns: LQ-2500 (EPSON.DRV)
49  Epson LQ-2550 Color 24 pins - 136 columns: LQ-2550 (EPSON.DRV)

```

50 Epson LQ-500 24 pins - 80 columns: LQ-500 (EPSON.DRV)  
51 Epson LQ-510 24 pins - 80 columns: LQ-510 (EPSON.DRV)  
52 Epson LQ-570 24 pins - 80 columns: LQ-570 (EPSON.DRV)  
53 Epson LQ-850 (N9) 24 pins - 80 columns: LQ-850 (N9) (EPSON.DRV)  
54 Epson LQ-850 24 pins - 80 columns: LQ-850 (EPSON.DRV)  
55 Epson LQ-860 Color 24 pins - 80 columns: LQ-860 (EPSON.DRV)  
56 Epson LQ-870 24 pins - 80 columns: LQ-870 (EPSON.DRV)  
57 Epson LQ-950 (N9) 24 pins - 110 columns: LQ-950 (N9) (EPSON.DRV)  
58 Epson LX-800 9 pins - 80 columns: LX-800 (EPSON.DRV)  
59 Epson LX-810 9 pins - 80 columns: LX-810 (EPSON.DRV)  
60 Epson Stylus 800 Inkjet: Stylus 800 (EPSON.DRV)  
61 Generic PostScript Printer: Generic PostScript Printer (PSCRIPT.DRV)  
62 HP 7470A Plotter: HP7470A (PLOTTERS.DRV)  
63 HP 7475A Plotter: HP7475A (PLOTTERS.DRV)  
64 HP 7550A Plotter: HP7550A (PLOTTERS.DRV)  
65 HP 7580A Plotter: HP7580A (PLOTTERS.DRV)  
66 HP 7580B Plotter: HP7580B (PLOTTERS.DRV)  
67 HP 7585A Plotter: HP7585A (PLOTTERS.DRV)  
68 HP 7585B Plotter: HP7585B (PLOTTERS.DRV)  
69 HP 7586B Plotter: HP7586B (PLOTTERS.DRV)  
70 HP ColorPro: HP7440A (PLOTTERS.DRV)  
71 HP DeskJet: HP DeskJet (HPDJPM.DRV)  
72 HP DeskJet 1200C: HP DeskJet 1200C (PSCRIPT.DRV)  
73 HP DeskJet 500: HP DeskJet 500 (HPDJPM.DRV)  
74 HP DeskJet 500 in Epson EPL-6000 mode: HP DeskJet 500 (EPSON.DRV)  
75 HP DeskJet 500C: HP DeskJet 500C (HPDJPM.DRV)  
76 HP DeskJet 510: HP DeskJet 510 (HPDJPM.DRV)  
77 HP DeskJet 550C: HP DeskJet 550C (HPDJPM.DRV)  
78 HP DeskJet Plus: HP DeskJet Plus (HPDJPM.DRV)  
79 HP DeskJet Portable: HP DeskJet Portable (HPDJPM.DRV)  
80 HP DraftMaster I: HP7595A (PLOTTERS.DRV)  
81 HP DraftMaster II: HP7596A (PLOTTERS.DRV)  
82 HP DraftPro: HP7570A (PLOTTERS.DRV)  
83 HP LaserJet 2000: HP LaserJet 2000 (LASERJET.DRV)  
84 HP LaserJet 4: HP LaserJet 4 (LASERJET.DRV)  
85 HP LaserJet 4/4M PS v2011\_110: HP LaserJet 4/4M PS v2011\_110 (PSCRIPT.DRV)  
86 HP LaserJet 4L: HP LaserJet 4L (LASERJET.DRV)  
87 HP LaserJet 4M: HP LaserJet 4M (LASERJET.DRV)  
88 HP LaserJet 4Si: HP LaserJet 4Si (LASERJET.DRV)  
89 HP LaserJet 4Si Mx: HP LaserJet 4Si Mx (LASERJET.DRV)  
90 HP LaserJet 4Si/4Si Mx PS v2011: HP LaserJet 4Si/4Si Mx PS v2011  
(PSCRIPT.DRV)  
91 HP LaserJet 500 Plus: HP LaserJet 500 Plus (LASERJET.DRV)  
92 HP LaserJet Classic: HP LaserJet Classic (LASERJET.DRV)  
93 HP LaserJet IID: HP LaserJet IID (LASERJET.DRV)  
94 HP LaserJet IID v52\_2: HP LaserJet IID v52\_2 (PSCRIPT.DRV)  
95 HP LaserJet III: HP LaserJet III (LASERJET.DRV)  
96 HP LaserJet III Cartridge Plus: HP LaserJet III Cartridge Plus  
(PSCRIPT.DRV)  
97 HP LaserJet III v52\_2: HP LaserJet III v52\_2 (PSCRIPT.DRV)  
98 P LaserJet IIID: HP LaserJet IIID (LASERJET.DRV)  
99 HP LaserJet IIID Cartridge Plus: HP LaserJet IIID Cartridge Plus  
(PSCRIPT.DRV)  
100 HP LaserJet IIID v52\_2: HP LaserJet IIID v52\_2 (PSCRIPT.DRV)  
101 P LaserJet IIIP: HP LaserJet IIIP (LASERJET.DRV)

102 HP LaserJet IIIP Cartridge Plus: HP LaserJet IIIP Cartridge Plus (PSCRIPT.DRV)  
 103 HP LaserJet IIIP PS v52\_2: HP LaserJet IIIP PS v52\_2 (PSCRIPT.DRV)  
 104 HP LaserJet IIISi: HP LaserJet IIISi (LASERJET.DRV)  
 105 HP LaserJet IIISi PS v52\_3: HP LaserJet IIISi PS v52\_3 (PSCRIPT.DRV)  
 106 HP LaserJet IIP: HP LaserJet IIP (LASERJET.DRV)  
 107 HP LaserJet IIP Plus: HP LaserJet IIP Plus (LASERJET.DRV)  
 108 HP LaserJet IIP v52\_2: HP LaserJet IIP v52\_2 (PSCRIPT.DRV)  
 109 HP LaserJet Plus: HP LaserJet Plus (LASERJET.DRV)  
 110 HP LaserJet Series II: HP LaserJet Series II (LASERJET.DRV)  
 111 HP PaintJet Driver by Micrografx: Paintjet (SMGXPJET.DRV)  
 112 HP PaintJet Driver by Micrografx: Paintjet XL (SMGXPJET.DRV)  
 113 PaintJet XL300 PS v2011\_112: HP PaintJet XL300 PS v2011\_112 (PSCRIPT.DRV)  
 114 IBM 2380 PPS II: IBM 2380 PPS II (IBM42XX.DRV)  
 115 IBM 2381 PPS II: IBM 2381 PPS II (IBM42XX.DRV)  
 116 IBM 2390 PPS II: IBM 2390 PPS II (IBM42XX.DRV)  
 117 IBM 2390 PS/1: IBM 2390 PS/1 (IBM42XX.DRV)  
 118 IBM 2391 PPS II: IBM 2391 PPS II (IBM42XX.DRV)  
 119 IBM 3816 - 01D: IBM 3816 - 01D (IBM52XX.DRV)  
 120 IBM 3816 - 01S: IBM 3816 - 01S (IBM52XX.DRV)  
 121 IBM 4019 LaserPrinter: IBM 4019 LaserPrinter (IBM4019.DRV)  
 122 IBM 4019 LaserPrinter E: IBM 4019 LaserPrinter E (IBM4019.DRV)  
 123 IBM 4019 Laserprinter: IBM 4019 Laserprinter (LASERJET.DRV)  
 124 IBM 4019 Laserprinter E: IBM 4019 Laserprinter E (LASERJET.DRV)  
 125 IBM 4019 v52\_1 (17 Fonts): IBM 4019 v52\_1 (17 Fonts) (PSCRIPT.DRV)  
 126 IBM 4019 v52\_1 (39 Fonts): IBM 4019 v52\_1 (39 Fonts) (PSCRIPT.DRV)  
 127 IBM 4029 (17 Fonts 300 Dpi): IBM 4029 (17 Fonts 300 Dpi) (PSCRIPT.DRV)  
 128 IBM 4029 (17 Fonts 600 Dpi): IBM 4029 (17 Fonts 600 Dpi) (PSCRIPT.DRV)  
 129 IBM 4029 (39 Fonts 300 Dpi): IBM 4029 (39 Fonts 300 Dpi) (PSCRIPT.DRV)  
 130 IBM 4029 (39 Fonts 600 Dpi): IBM 4029 (39 Fonts 600 Dpi) (PSCRIPT.DRV)  
 131 IBM 4029 LaserPrinter 10: IBM 4029 LaserPrinter 10 (IBM4019.DRV)  
 132 IBM 4029 LaserPrinter 10L: IBM 4029 LaserPrinter 10L (IBM4019.DRV)  
 134 IBM 4029 LaserPrinter 10P: IBM 4029 LaserPrinter 10P (IBM4019.DRV)  
 135 IBM 4029 LaserPrinter 5E: IBM 4029 LaserPrinter 5E (IBM4019.DRV)  
 136 IBM 4029 LaserPrinter 6: IBM 4029 LaserPrinter 6 (IBM4019.DRV)  
 137 IBM 4029 LaserPrinter 6P: IBM 4029 LaserPrinter 6P (IBM4019.DRV)  
 138 IBM 4029 Laserprinter 10: IBM 4029 Laserprinter 10 (LASERJET.DRV)  
 139 IBM 4029 Laserprinter 10L: IBM 4029 Laserprinter 10L (LASERJET.DRV)  
 140 IBM 4029 Laserprinter 5E: IBM 4029 Laserprinter 5E (LASERJET.DRV)  
 141 IBM 4029 Laserprinter 6: IBM 4029 Laserprinter 6 (LASERJET.DRV)  
 142 IBM 4039 LaserPrinter (300 Dpi): IBM 4039 LaserPrinter (300 Dpi) (PSCRIPT.DRV)  
 143 IBM 4039 LaserPrinter (600 Dpi): IBM 4039 LaserPrinter (600 Dpi) (PSCRIPT.DRV)  
 144 IBM 4070 IJ: IBM 4070 IJ (IBM42XX.DRV)  
 145 IBM 4072 ExecJet: IBM 4072 ExecJet (IBM42XX.DRV)  
 146 IBM 4079 Color Jetprinter PS: IBM 4079 Color Jetprinter PS (PSCRIPT.DRV)  
 147 IBM 4201 Proprinter: IBM 4201 Proprinter (IBM42XX.DRV)  
 148 IBM 4201 Proprinter II: IBM 4201 Proprinter II (IBM42XX.DRV)  
 149 IBM 4201 Proprinter III: IBM 4201 Proprinter III (IBM42XX.DRV)  
 150 IBM 4202 Proprinter II XL: IBM 4202 Proprinter II XL (IBM42XX.DRV)  
 151 IBM 4202 Proprinter III XL: IBM 4202 Proprinter III XL (IBM42XX.DRV)  
 152 IBM 4202 Proprinter XL: IBM 4202 Proprinter XL (IBM42XX.DRV)  
 153 IBM 4207 Proprinter X24: IBM 4207 Proprinter X24 (IBM42XX.DRV)  
 154 IBM 4207 Proprinter X24E: IBM 4207 Proprinter X24E (IBM42XX.DRV)  
 155 IBM 4208 Proprinter XL24: IBM 4208 Proprinter XL24 (IBM42XX.DRV)



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156 IBM 4208 Proprinter XL24E: IBM 4208 Proprinter XL24E (IBM42XX.DRV)  
157 IBM 4216-031 v51\_4 SheetFeed: IBM 4216-031 v51\_4 SheetFeed (PSCRIPT.DRV)  
158 IBM 4224 - 01 & 02 & E3: IBM 4224 - 01 & 02 & E3 (IBM42XX.DRV)  
159 IBM 4224 - C2: IBM 4224 - C2 (IBM42XX.DRV)  
160 IBM 4226 Model 302: IBM 4226 Model 302 (IBM42XX.DRV)  
161 IBM 5183 Portable Printer: IBM 5183 Portable Printer (EPSON.DRV)  
162 IBM 5201 Quietwriter II (IBM52012.DRV)  
163 IBM 5202 QuietWriter III: IBM 5202 QuietWriter III (IBM52XX.DRV)  
164 IBM 5204 QuickWriter: IBM 5204 QuickWriter (IBM52XX.DRV)  
165 IBM 6180 Plotter: IBM6180 (PLOTTERS.DRV)  
166 IBM 6182 Plotter: IBM6182 (PLOTTERS.DRV)  
167 IBM 6184 Plotter: IBM6184 (PLOTTERS.DRV)  
168 IBM 6186-1 Plotter: IBM6186-1 (PLOTTERS.DRV)  
169 IBM 6186-2 Plotter: IBM6186-2 (PLOTTERS.DRV)  
170 IBM 7371 Plotter: IBM7371 (PLOTTERS.DRV)  
171 IBM 7372 Plotter: IBM7372 (PLOTTERS.DRV)  
172 IBM 7374 Plotter: IBM7374 (PLOTTERS.DRV)  
173 IBM 7375-1 Plotter: IBM7375-1 (PLOTTERS.DRV)  
174 IBM 7375-2 Plotter: IBM7375-2 (PLOTTERS.DRV)  
175 IBM NULL Printer Driver (IBMNUL.DRV)  
176 IBM Personal Page Printer II-30: IBM Personal Page Printer II-30 (PSCRIPT.DRV)  
177 IBM Personal Page Printer II-31: IBM Personal Page Printer II-31 (PSCRIPT.DRV)  
178 IBM Personal Pageprinter: IBM Personal Pageprinter (PSCRIPT.DRV)  
179 Kyocera F-1000A/F-1000: Kyocera F-1000A/F-1000 (LASERJET.DRV)  
180 Kyocera F-1800A/F-1800: Kyocera F-1800A/F-1800 (LASERJET.DRV)  
181 Kyocera F-2000A/F-2200S: Kyocera F-2000A/F-2200S (LASERJET.DRV)  
182 Kyocera F-3000A/F-3300: Kyocera F-3000A/F-3300 (LASERJET.DRV)  
183 Kyocera F-5000A/F-5000: Kyocera F-5000A/F-5000 (LASERJET.DRV)  
184 Kyocera F-800A/F-800: Kyocera F-800A/F-800 (LASERJET.DRV)  
185 Kyocera F-820: Kyocera F-820 (LASERJET.DRV)  
186 Kyocera FS-1500A/FS-1500: Kyocera FS-1500A/FS-1500 (LASERJET.DRV)  
187 Kyocera FS-3500A/FS-3500: Kyocera FS-3500A/FS-3500 (LASERJET.DRV)  
188 Kyocera FS-5500A/FS-5500: Kyocera FS-5500A/FS-5500 (LASERJET.DRV)  
189 Kyocera FS-850A/FS-850: Kyocera FS-850A/FS-850 (LASERJET.DRV)  
190 Kyocera P-2000: Kyocera P-2000 (PSCRIPT.DRV)  
191 Kyocera Q-8010: Kyocera Q-8010 (PSCRIPT.DRV)  
192 Linotronic 100 v38\_0: Linotronic 100 v38\_0 (PSCRIPT.DRV)  
193 Linotronic 100 v42\_5: Linotronic 100 v42\_5 (PSCRIPT.DRV)  
194 Linotronic 200 v47\_1: Linotronic 200 v47\_1 (PSCRIPT.DRV)  
195 Linotronic 200 v49\_3: Linotronic 200 v49\_3 (PSCRIPT.DRV)  
196 Linotronic 300 v47\_0: Linotronic 300 v47\_0 (PSCRIPT.DRV)  
197 Linotronic 300 v47\_1: Linotronic 300 v47\_1 (PSCRIPT.DRV)  
198 Linotronic 300 v49\_3: Linotronic 300 v49\_3 (PSCRIPT.DRV)  
199 Linotronic 500 v49\_3: Linotronic 500 v49\_3 (PSCRIPT.DRV)  
200 NEC LC-890: NEC LC-890 (PSCRIPT.DRV)  
201 Olivetti LP 5000: Olivetti LP 5000 (PSCRIPT.DRV)  
202 Panasonic KX-P1123 in Epson LQ-850 mode: Panasonic KX-P1123 (EPSON.DRV)  
203 Panasonic KX-P1124 in Epson LQ-2500 mode: Panasonic KX-P1124 (EPSON.DRV)  
204 Panasonic KX-P1124i in Epson LQ-850 mode: Panasonic KX-P1124i (EPSON.DRV)  
205 Panasonic KX-P1180 in Epson FX-86e mode: Panasonic KX-P1180 (EPSON.DRV)  
206 Panasonic KX-P1191 in Epson FX-86e mode: Panasonic KX-P1191 (EPSON.DRV)  
207 Panasonic KX-P1624 in Epson LQ-2500 mode: Panasonic KX-P1624 (EPSON.DRV)  
208 Panasonic KX-P1654 in Epson LQ-1050 mode: Panasonic KX-P1654 (EPSON.DRV)  
209 Panasonic KX-P1695 in Epson FX-1050 mode: Panasonic KX-P1695 (EPSON.DRV)  
210 Panasonic KX-P2123 in Epson LQ-860 mode: Panasonic KX-P2123 (EPSON.DRV)

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211 Panasonic KX-P2124 in Epson LQ-860 mode: Panasonic KX-P2124 (EPSON.DRV)  
 212 Panasonic KX-P2180 in Epson LX-850 mode: Panasonic KX-P2180 (EPSON.DRV)  
 213 Panasonic KX-P2624 in Epson LQ-1050 mode: Panasonic KX-P2624 (EPSON.DRV)  
 214 Panasonic KX-P4410: Panasonic KX-P4410 (LASERJET.DRV)  
 215 Panasonic KX-P4420: Panasonic KX-P4420 (LASERJET.DRV)  
 216 Panasonic KX-P4430: Panasonic KX-P4430 (LASERJET.DRV)  
 217 Panasonic KX-P4450: Panasonic KX-P4450 (LASERJET.DRV)  
 218 Panasonic KX-P4450i: Panasonic KX-P4450i (LASERJET.DRV)  
 219 Panasonic KX-P4455 v51\_4: Panasonic KX-P4455 v51\_4 (PSCRIPT.DRV)  
 220 Phaser Card v1\_1: Phaser Card v1\_1 (PSCRIPT.DRV)  
 221 QMS 1725 Print System: QMS 1725 Print System (PSCRIPT.DRV)  
 222 QMS 860 Print System: QMS 860 Print System (PSCRIPT.DRV)  
 223 QMS ColorScript 100: QMS ColorScript 100 (PSCRIPT.DRV)  
 224 QMS ColorScript 100 Mod 10: QMS ColorScript 100 Mod 10 (PSCRIPT.DRV)  
 225 QMS ColorScript 100 Mod 30: QMS ColorScript 100 Mod 30 (PSCRIPT.DRV)  
 226 QMS ColorScript 100 Mod 30si: QMS ColorScript 100 Mod 30si (PSCRIPT.DRV)  
 227 QMS ColorScript 210: QMS ColorScript 210 (PSCRIPT.DRV)  
 228 QMS ColorScript 230: QMS ColorScript 230 (PSCRIPT.DRV)  
 229 QMS IS X320T: QMS IS X320T (PSCRIPT.DRV)  
 230 QMS-PS 1500: QMS-PS 1500 (PSCRIPT.DRV)  
 231 QMS-PS 1700: QMS-PS 1700 (PSCRIPT.DRV)  
 232 QMS-PS 2000: QMS-PS 2000 (PSCRIPT.DRV)  
 233 QMS-PS 2200: QMS-PS 2200 (PSCRIPT.DRV)  
 234 QMS-PS 2210: QMS-PS 2210 (PSCRIPT.DRV)  
 235 QMS-PS 2220: QMS-PS 2220 (PSCRIPT.DRV)  
 236 QMS-PS 410: QMS-PS 410 (PSCRIPT.DRV)  
 237 QMS-PS 800: QMS-PS 800 (PSCRIPT.DRV)  
 238 QMS-PS 800 Plus: QMS-PS 800 Plus (PSCRIPT.DRV)  
 239 QMS-PS 810: QMS-PS 810 (PSCRIPT.DRV)  
 240 QMS-PS 810 Turbo: QMS-PS 810 Turbo (PSCRIPT.DRV)  
 241 QMS-PS 815: QMS-PS 815 (PSCRIPT.DRV)  
 242 QMS-PS 815 MR: QMS-PS 815 MR (PSCRIPT.DRV)  
 243 QMS-PS 820: QMS-PS 820 (PSCRIPT.DRV)  
 244 QMS-PS 820 Turbo: QMS-PS 820 Turbo (PSCRIPT.DRV)  
 245 QMS-PS 825: QMS-PS 825 (PSCRIPT.DRV)  
 246 QMS-PS 825 MR: QMS-PS 825 MR (PSCRIPT.DRV)  
 247 Qume ScriptEN: Qume ScriptEN (PSCRIPT.DRV)  
 248 Seiko ColorPoint PS Model 04: Seiko ColorPoint PS Model 04 (PSCRIPT.DRV)  
 249 Seiko ColorPoint PS Model 14: Seiko ColorPoint PS Model 14 (PSCRIPT.DRV)  
 250 Seiko Personal ColorPoint PS: Seiko Personal ColorPoint PS (PSCRIPT.DRV)  
 251 Seiko Personal ColorPoint PSE: Seiko Personal ColorPoint PSE (PSCRIPT.DRV)  
 252 Silentwriter LC 890XL v50\_5: Silentwriter LC 890XL v50\_5 (PSCRIPT.DRV)  
 253 Silentwriter2 290 v52\_0: Silentwriter2 290 v52\_0 (PSCRIPT.DRV)  
 254 Silentwriter2 Model 90 v52\_2: Silentwriter2 Model 90 v52\_2 (PSCRIPT.DRV)  
 255 TI 2115 (13 fonts) v47\_0: TI 2115 (13 fonts) v47\_0 (PSCRIPT.DRV)  
 256 TI OmniLaser 2108: TI OmniLaser 2108 (PSCRIPT.DRV)  
 257 TI Omnilaser 2115: TI Omnilaser 2115 (PSCRIPT.DRV)  
 258 TI microLaser PS17 v\_52\_1: TI microLaser PS17 v\_52\_1 (PSCRIPT.DRV)  
 259 TI microLaser PS35 v\_52\_1: TI microLaser PS35 v\_52\_1 (PSCRIPT.DRV)  
 260 Tektronix Phaser 200e 17 fonts: Tektronix Phaser 200e 17 fonts  
 (PSCRIPT.DRV)  
 261 Tektronix Phaser 200e 39 fonts: Tektronix Phaser 200e 39 fonts  
 (PSCRIPT.DRV)  
 262 Tektronix Phaser 200i v2011\_108: Tektronix Phaser 200i v2011\_108  
 (PSCRIPT.DRV)  
 263 Tektronix Phaser II PX v2\_02: Tektronix Phaser II PX v2\_02 (PSCRIPT.DRV)

**Student Notebook**

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- 264 Tektronix Phaser II PXe 17 font: Tektronix Phaser II PXe 17 font (PSCRIPT.DRV)
- 265 Tektronix Phaser II PXe 39 font: Tektronix Phaser II PXe 39 font (PSCRIPT.DRV)
- 266 Tektronix Phaser II PXi v2010: Tektronix Phaser II PXi v2010 (PSCRIPT.DRV)
- 267 Tektronix Phaser III PXi v2010: Tektronix Phaser III PXi v2010 (PSCRIPT.DRV)
- 268 Tektronix Phaser IISD v2011: Tektronix Phaser IISD v2011 (PSCRIPT.DRV)
- 269 Varityper VT-600: Varityper VT-600 (PSCRIPT.DRV)
- 270 Wang LCS15: Wang LCS15 (PSCRIPT.DRV)
- 271 Wang LCS15 FontPlus: Wang LCS15 FontPlus (PSCRIPT.DRV)

## Appendix B: Exercise 1.1 Solution

This Appendix contains the solutions to Exercise 1.1.

## Unit 1. Exercise 1.1

Use your basic Workplace Shell skills to answer the following questions. If you need help, you may refer to the exercise instructions in Appendix B.

\_\_\_\_ 1. The OS2SYS.INI file is located in the OS/2 directory.

**Find the file:**

- Display the desktop pop-up menu.
- Select **Find**.
- Set the **Folder** path to **C:\** and the **Name** to **\*.INI**.
- Select **Search all subfolders**.
- Press **Find**.
- The Find Results folder will contain two OS2SYS.INI files; one in the OS2 directory and one in the INSTALL directory.

**Read the help to determine which of these is the "master", used by OS/2:**

- Display desktop pop-up menu and press **Help**.
- Select **Help Index**.
- Press **Search** and search **All sections** for OS2SYS.INI.

\_\_\_\_ 2. The README object is located in the Information folder.

- Use the **Find** command to locate README.

\_\_\_\_ 3. Which of the following actions is not available for the OS/2 System folder?

Delete, Create shadow, Move, Copy Delete

- Display the **OS/2 System** folder pop-up menu.

\_\_\_\_ 4. What are the available views of the OS/2 System folder? Settings icon,  
tree and details

- Display pop-up menu of the **OS/2 System** folder.
- Display cascade menu of **Open** by pressing the arrow.

\_\_\_\_ 5. Which objects on your Desktop are shadows? Drive A

- Shadows are identified by light gray title text.
- If you cannot differentiate the colors, display the pop-ups of each object and locate those with action **Original**.

- \_\_\_ 6. Jim calls the Help desk. He doesn't want to see a message box to confirm deletion of objects when dragged to the Shredder. What should he do?

Follow the steps given below

- Display the desktop pop-up menu and select **System setup**.
- Open the **System** object.
- Deselect **Confirm on folder delete** and **Confirm on delete**.

- \_\_\_ 7. Helen uses the OS/2 command interface frequently. What can she do to make access to the command prompt convenient? \_\_\_\_\_

Put a copy of the OS/2 window command prompt on the desktop

- Open **OS/2 System**.
- Open **Command Prompts**.
- Select **OS/2 Windows**.
- Holding **Ctrl** key, drag a copy of the object to the desktop.

- \_\_\_ 8. Mary has move the MYPROG.EXE file to the desktop and her program will not run correctly. What should she do to fix the problem? \_\_\_\_\_

She should move the EXE file back to its install directory. Next she should create a program reference object, pointing to the real EXE file.

- Open the **Templates** folder; drag a **Program** object to the desktop.
- Enter the path and program name in the **Program** field. Close the Setting notebook.

- \_\_\_ 9. John wants to double-click a data file created by an old DOS application and have the file loaded into the application automatically. What should he do?

He should associate the data file with the application.

- Open the **Settings** notebook of the application. Tab to the **Association** page.
- Enter the data file name in the **New Name** field. Add it to the **Current Names** box.
- Close the Settings notebook.



## Appendix C: Checkpoint Answers

This Appendix contains the answers to the Checkpoint questions contained in this course.



## Unit 2

### Checkpoint (page 2-16)

1. If you do not have enough free space in the install partition to install all the OS/2 function you need, what components can be installed in other partitions?

*SWAPPER.DAT file and WIN-OS/2 Support*

2. Your new machine has a 300MB disk. Would you partition the drive with at least a C: and D: drive? Yes. If so, why?

*Large disks should be partitioned to provide flexibility to change their configurations using FDISK for future needs and to separate them into manageable entities for each backup and restore activity.*

3. Which reference is a good source of information about application on OS/2?

*The users guide, "Using the Operating System", contains information on specific application.*

4. How is the minimum OS/2 configuration installed?

*Deselect all options in the **OS/2 Setup and Installation** screen (Selecting features).*

5. Upon what two factors does the amount of space for the swap file depend?

*physical memory on the machine and system work load*

## Unit 3

### Checkpoint (page 3-18)

1. You system has a 120MB hard disk and 6MB of memory. You will have only one partition. Which file system will you use? Why?

*Two criteria are relevant to the information given: 120MB drive is fairly large and HPFS might be chosen. But with 6MB of memory, FAT is recommended since HPFS can use about 300-500KB of memory. Further analysis of your needs will indicate if performance or data integrity is most important.*

2. You need to back up a directory on an OS/2 FAT drive. Should you use a DOS back up program? Why?

*Many DOS backup programs cannot handle extended attributes. On a FAT drive the EAs are stored in a hidden file. If the file is lost, you cannot restore the drive correctly.*

3. You have the following hard disk configuration:

C: DOS 5.0 FAT  
D: OS/2 2.1 HPFS  
E: application FAT

What drive letter is used for native DOS on Drive C: to access application data on the application FAT drive?

*D*

4. Do you think a DOS LAN requester can access data on an OS/2 LAN Server HPFS drive?

*A DOS LAN requester can access data on an OS/2 Server. OS/2 handles the input/output of data and accesses the file system.*

## Unit 4

### Checkpoint (page 4-11)

1. Your machine has a single C: drive with both native DOS and OS/2 installed on it. How do you:
  - (a) switch from OS/2 to DOS *Enter the command BOOT /DOS*
  - (b) switch from DOS to OS/2 *Enter the command BOOT /OS2*
  - (c) Which operating system will boot at power up time?  
*The system last active at shutdown.*
2. You are installing OS/2 2.1 over an existing OS/2 2.0 system without formatting.
  - (a) Your 2.0 system already has all fonts and documentation. Should you select fonts and documentation to be reinstalled?  
*Yes, existing 2.0 function is deleted.*
  - (b) Installing 2.1 over 2.0 will preserve the WIN-OS/2 3.0 environment.  
*False*
3. A system may have both Dual Boot and Boot Manager installed.  
*True.*

## Unit 5

### Checkpoint (page 5-13)

1. Assigning multiple ports to a printer object, each port with identically configured ports is called printer *pooling*.
2. Configuring multiple printer objects, each with different job properties and assigning them to the same port is called printer *sharing*.
3. Where might you want to use the technique of having all the printer drivers on a hard drive?

*Putting drivers on a LAN Server would make them available to all users.*

4. Why are separate printer drivers necessary for WIN-OS/2?

*Windows applications use different program calls to create printer output. These WIN-OS/2 drivers are needed to create the print data.*

5. How is a print job deleted?

*Display the pop-up menu of the job object and select Delete.*

## Unit 7

### Checkpoint (page 7- 4)

Fill in the appropriate file names to build backup copies of your INI files.  
When this sequence of commands is executed four times, you will have a history of your \*.INI file values. This technique is sometimes called "grandfathering."

REM \*\*\*Build Backup History of INI Files \*\*\*

C:

XCOPY C:\OS2\INSTALL\OS2.3 C:\OS2\INSTALL\OS2.4

XCOPY C:\OS2\INSTALL\OS2.2 C:\OS2\INSTALL\OS2.3

XCOPY C:\OS2\INSTALL\OS2.1 C:\OS2\INSTALL\OS2.2

XCOPY C:\OS2\INSTALL\OS2.INI C:\OS2\INSTALL\OS2.1

XCOPY C:\OS2\INSTALL\OS2SYS.3 C:\OS2\INSTALL\OS2SYS.4

XCOPY C:\OS2\INSTALL\OS2SYS.2 C:\OS2\INSTALL\OS2SYS.3

XCOPY C:\OS2\INSTALL\OS2SYS.1 C:\OS2\INSTALL\OS2SYS.2

XCOPY C:\OS2\INSTALL\OS2SYS.INI C:\OS2\INSTALL\OS2SYS.1

CD\

REM \*\*\* You did it ... \*\*\*

**Note:** These statements can be executed in the OS/2 STARTUP.CMD file or be put in a \*.CMD file and placed in the Startup folder.

## Unit 7

### Checkpoint (page 7- 11)

Match the following CONFIG.SYS function to the appropriate statement number below.

Command Process file paths	<u>7</u>
System environment options:	
- Autostart	<u>4</u>
- Prompts	<u>9</u>
Set up path defaults for:	
- Dynamic Link Libraries	<u>12</u>
- Subdirectories	<u>7,8</u>
- Help files	<u>10</u>
- Glossaries	<u>11</u>
- Reference Materials	<u>15</u>
- User & System INI files	<u>2,1</u>
- Command Retrieval	<u>13</u>
Set up devices for a:	
- Communication port	<u>18</u>
- DASD	<u>17</u>
- Diskette or hard drive	<u>19</u>
- Display	<u>20,25,26,27</u>
- Keyboard	<u>21</u>
- Pointing device	<u>23</u>
- Printer	<u>24</u>

1. SET USER\_INI=C:\OS2\OS2.INI
2. SET SYSTEM\_INI=C:\OS2\OS2SYS.INI
3. SET OS2\_SHELL=C:\OS2\CMD.EXE
4. SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS
5. SET RUNWORKPLACE=C:\OS2\PMSHELL.EXE
6. SET COMSPEC=C:\OS2\CMD.EXE
7. SET PATH=C:\OS2;\OS2\SYSTEM;\C:\OS2\MDOS\WINOS2;\C:\OS2\INSTALL;\C;\...
8. SET DPATH=C:\OS2;\OS2\SYSTEM;\C:\OS2\MDOS\WINOS2;\C:\OS2\INSTALL;\C;\...
9. SET PROMPT=\$i\$P
10. SET HELP=C:\OS2\HELP;\OS2\HELP\TUTORIAL;
11. SET GLOSSARY=C:\OS2\HELP\GLOSS;
12. LIBPATH=.;D:\OS2\DLL;D:\OS2\MDOS;D:\D:\OS2\APPS\DLL;
13. SET KEYS=ON
14. SET DELDIR=C:\DELETE,512;D:\DELETE,512,E:\DELETE,512;
15. SET BOOKSHELF=C:\OS2\BOOK;
16. SET EPMPATH=C:\OS2\APPS;
17. BASEDEV=OS2DASD.DMD
18. DEVICE=D:\OS2\COM.SYS
19. BASEDEV=IBM1FLPY.ADD
20. SET VIO\_VGA=DEVICE(BVHVGA)
21. DEVINFO=KBD,US,D:\OS2\KEYBOARD.DCP
22. DEVICE=D:\OS2\POINTDD.SYS
23. DEVICE=D:\OS2\MOUSE.SYS
24. DEVICE=D:\OS2\PRINTER4.SYS
25. DEVINFO=SCR,VGA,D:\OS2\VIOTBL.DCP
26. SET VIDEO\_DEVICES=VG\IO\_VGA
27. CODEPAGE=437,850

## Unit 8

### Checkpoint (page 8-11)

1. What is the feature of the 80386 chip that OS/2 uses to provide protection of one DOS application from another?

*Protect mode*

2. What key combination is used to switch a DOS full screen session to a window on the Desktop (and vice versa)?

*Alt+Home*

3. What action should be tried if a DOS program runs out of memory?

*Close the session. Use the DOS Settings menu to allocate more EMS, XMS, or DPML memory as needed.*

4. Are dynamically configured DOS (and WIN-OS/2) settings permanently saved?

*No. Settings dynamically changed are active only for the session. Permanent changes are made before the session is initialized.*

5. All DOS applications on your customer's system need a special device driver that is not supported by an OS/2 VDD. Where is the device statement specified?

*Specify application-unique drivers with the DOS\_DEVICE statement in the object's DOS Settings notebook. If all VDMs need a device driver, it can be added to CONFIG.SYS, instead of to each application settings.*

6. Your customer has four applications which will run concurrently. Each requires 8MB of extended memory. Can these four applications run successfully?

*Yes, each application can have up to 16MB of extended memory.*

## Unit 8

### Checkpoint (page 8-26)

1. What is the main performance advantage of running Windows applications in a shared VDM session?

*Only one copy of WIN-OS/2 is loaded so overall system resource usage is minimized. Also, once the VDM is initialized for the first application, subsequent applications load immediately.*

2. What are two disadvantages?

*(a) Applications in a shared VDM can interfere with one another.*

*(b) The Settings of the first application are used for the VDM and must be adequate and appropriate for all applications loaded in the VDM.*

3. Why might WIN-OS2 PM mode be important to your customers?

*This full-screen mode looks like the Windows environment*

4. What are two main advantages of using program reference objects?

*(a) They can be uniquely configured for different execution environments, using the same \*.EXE file.*

*(b) They can be located anywhere, independent of DLLs or data files.*

5. List two advantages of using the migration program for DOS and Windows programs.

*(a) OS/2 puts a program reference in a desktop folder.*

*(b) The program reference has commonly-needed settings.*

6. How would you set the Ctrl + Esc key sequence to immediately display the Window List when using the WIN-OS/2 Full Screen command prompt session?

*Change the WIN-OS/2 Setting KBD\_CTRL\_BYPASS.*





## Appendix D: Case Study Recommendations

This Appendix contains recommendations for the Case Studies contained in this course.

## Case Study (page 3-5) Disk Layouts

### Current Environment

Your customer's machine has 120MB of actual space and is configured with two partitions.

C: Primary 60MB

D: Logical 60MB

### Required

1. Your customer wants three bootable operating system drives of at least 25MB each.
2. Your customer wants two logical drives of equal size using the remaining free space.

Steps to be performed:

1. Delete all partitions.
2. Create two primary partitions, 25MB each.
3. Create a logical drive, 25MB.
4. Install Boot Manager at the end of the free space.
5. Create two more logical drives, each using one-half of the free space.

One Possible Solution:

C: 25MB

C: 25MB

D: 25MB

E: 22MB

F: 22MB

Boot manager, 1MB

## Case Study (page 3-6) Multiple Volumes

### Current Environment

Your customer's machine has a disk configured as follows:

C: Primary 160MB  
No free space

### Required

Your customer is adding a second volume and wants two bootable operating systems: OS/2 2.0 on Volume 1 and OS/2 2.1 on Volume 2. Allow 50MB of space for each operating system.

Both Volume 1 and 2 need two logical drives each for data; allow a minimum of 54MB for each drive.

Steps to be performed on Volume 1:

1. Delete C:
2. Install Boot Manager
3. Create C: with 50MB
4. Create D: (becomes E when a primary partition is created on Volume 2)
5. Create E: (becomes F)

Steps to be performed on Volume 2:

1. Create a primary, 50MB ( D:)
2. Create G:
3. Create H:

Solution:

#### Volume 1:

Access	Mbytes
Boot Mgr.	1
C: primary	50
E: logical	54
F: logical	54
free space	1

#### Volume 2:

Access	Mbytes
D: primary	50
G: logical	54
H: logical	54
free space	2

Alternative solution

Volume 1:

Access	Mbytes
primary	1
C: primary	50
D: logical	54
E: logical	54
free space	1

Volume 2:

Access	Mbytes
unusable	1
F: logical	50
G: logical	54
H: logical	54
free space	1

## Case Study (page 4-19) Existing DOS System

### Current Environment

- Your customer has a 245MB hard disk with a single C: drive formatted FAT.
- DOS, Windows 3.1, and OS/2 2.0 are installed with all features. The DOS and Windows 3.1 code use about 12MB of disk space: OS/2 2.0 uses about 30MB and a 15MB swap file..
- All applications, with the exception of a Windows 3.1 application, can be run under OS/2 2.0.
- The disk is 85% full.
- The system has 16MB memory.
- Performance has been degrading recently.

The customer is expecting you to recommend a solution to improve performance on the system and to allow for future growth. The customer has expressed interest in OS/2 2.1. What will you recommend? Use the following questions to analyze this question:

### WILL YOU KEEP OR REPLACE THE EXISTING SYSTEM?

1. How does the customer currently run the Windows 3.1 application?  
*The customer uses Dual Boot to run the Windows 3.1 application.*
2. How will you address the performance issue? What do you think may be contributing to the performance problem?  
*Chances are the FAT file system is fragmented and getting worse as time goes on. The swap file may be forced to fragment as well.*
3. Will you need to keep DOS, Windows 3.1, or OS/2 2.0 to meet the customer's requirement?  
*No. Applications will all run on OS/2 2.1. The customer is already using OS/2 2.0, so training may not be an issue. In addition, the WIN-OS/2 desktop can be configured to look like the native Windows 3.1 desktop. (Migrating Windows desktop will be covered in Unit 8.)*
4. Can OS/2 2.1 be added to this system?  
*You may be able to install OS/2 2.1 over OS/2 2.0. However, the requirements can be met by backing up the applications and data on the hard disk and repartitioning the disk to improve performance and management of the disk.*

5. Is there sufficient memory and disk space to support current needs?  
Yes.

6. Is there sufficient space to install all features of OS/2 2.1?  
Yes.

### WHAT IS YOUR PROPOSED DISK LAYOUT?

1. What is the drive layout?  
*There is no one answer but here is a suggestion: C: 40MB, D: 20MB (swapfile), E: 100 (data and applications), F: 84MB, Boot Manager.*
2. How will each drive be formatted?  
*E and F should probably be formatted HPFS; C and D FAT.*
3. What provision should be made for future growth?  
*Leave some free space or install the Boot Manager.*
4. How is the performance issue addressed?  
*By repartitioning the disk into smaller drives and formatting large drives with HPFS, the risk of fragmentation is reduced.*
5. Where will you put the swap file?  
*The swap file is put in its own partition.*
6. Where will you put OS/2 2.1? Will you put Win-OS/2 on the same drive?  
*Since you have a choice, you might put WIN\_OS2 in the same partition as OS/2. The ability to put it on a separate drive is useful in cases where space is an issue.*
7. Are there other considerations not addressed in the problem description?

## Case Study (page 4-21) Expand OS/2 1.3 Extended Edition Systems Used By System Test Staff

### Current Environment

Your customer has a support team that tests applications. These testers use a LAN for print and messaging. At this time, they do not use the LAN for file serving. Access to the server is currently provided by the OS/2 1.3 Extended Edition LAN Requester.

The customer is upgrading their application to run on OS/2 2.0 and OS/2 2.1. They will continue support for the OS/2 1.3 application. The customer wants to put the three platforms on each test machine.

The customer requires only the minimal OS/2 system to test their application. They do not need online references, productivity tools, etc.

- Your customer has a 245MB hard disk with a C: drive of 40MB, formatted FAT.
- The D: drive has 150 MB of programs and data and is formatted HPFS.
- The remaining space is E:, 55 MB and is used for miscellaneous tools.
- DOS and OS/2 1.3 Extended Edition are installed on the C: drive; Extended Edition includes its base code and the LAN Requester code.  
The C: partition has a swap file which is typically about 5 MB.
- The system has 16MB memory.
- Performance is satisfactory.
- It has been determined that the OS/2 2.0 support needed will take about 15MB of disk space, not including a swap file.

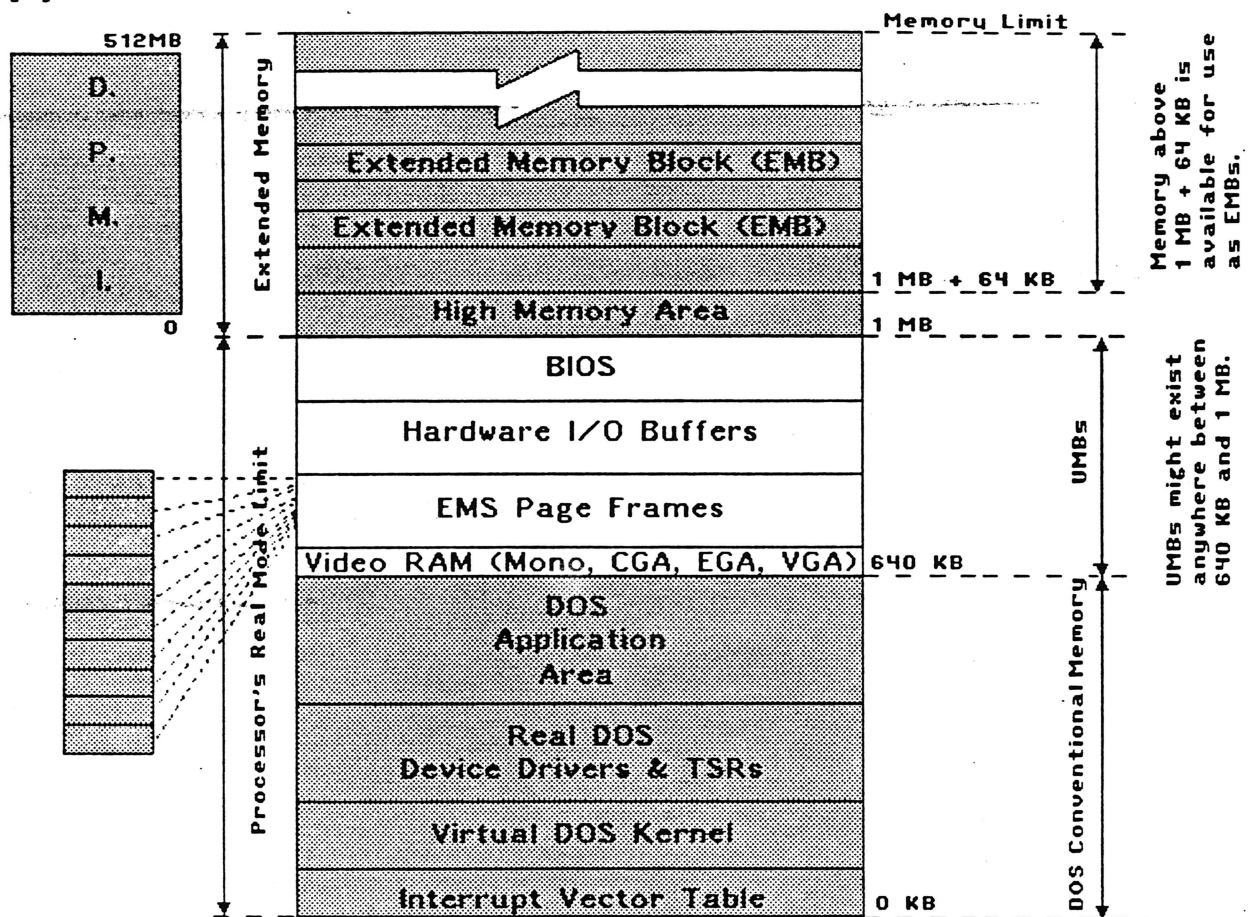
What will you recommend? Use the following questions to analyze this question:

1. How much disk space is required for the OS/2 2.1 minimal system?  
*About 20MB.*
2. What is the total amount of space which must be available to install OS/2 2.0 and OS/2 2.1 and have access to both?  
*15MB for OS/2 2.0, 16MB OS/2 2.1, about 15 MB swap file used by either system, 1MB Boot Manager. Total about 47-50MB.*
3. What will you do about the swap file for OS/2 2.0? For OS/2 2.1?  
*Use the same drive as swap file for both systems.*



4. How will you get the space needed?  
*One possibility is to move the tools on the E drive to a LAN Server, since the customer already has the connectivity and access. The E drive can be deleted and 3 new drives/partitions created to hold the Boot Manager and the two operating systems.*
5. Are there other considerations not addressed in the problem description?

## Appendix E: Memory



The diagram above shows some of the types of memory commonly referred to.

Conventional memory	Refers to the area of memory that lies between 0 and 640 KB.
Extended Memory (XMS)	Refers to any memory above the 1 MB line which is addressed by the process or in protected mode.
High Memory Area (HMA)	Refers to that area of memory between the 1 MB and the (1 MB + 64 KB) line.
Expanded Memory Blocks (EMBs)	That area of memory above the HMA not accessible from real mode.
UMA, UMB	Refers to that area of memory between 640 KB and 1 MB.
Expanded Memory (EMS)	A page mapping technique that provides additional memory support by allowing DOS applications to allocate and access up to 32MB of additional memory.

<i>Table 2. Worksheet for Estimating Hard Disk Space</i>		
Component	Required Space	User Requirements
Operating System	20MB - 40MB	
File System		
HPFS	3MB - 5MB	
FAT	64KB	
Printer Device Drivers	250KB - 1MB	
Print Spooler File Space	1MB - 5MB	
Swapper File	8MB or more	
MMPM/2	5MB	
Application Development		
Toolkit	9MB	
Online Reference	8MB	
Development Tools	8MB	
Device Driver Source Kit	80MB on HPFS, 120MB on FAT	
Debug Kernel & Symbols		
Compiler & Libraries	4MB	
IBM WorkFrame/2	9MB	
	2MB	
Total	-	

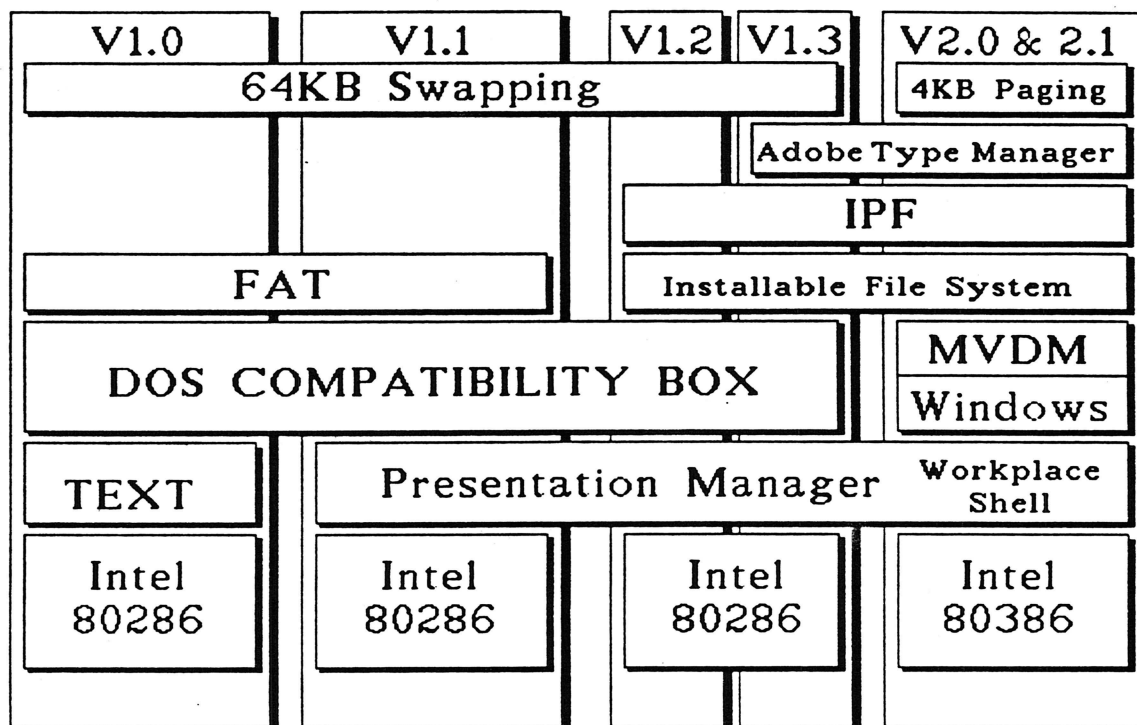
Table 1. Worksheet for Estimating Memory (RAM) Requirements		
Component	Memory	User Requirements
Base Operating System	3.0MB	
High Performance File System (HPFS)	0.3MB	
DOS Session <sup>1</sup>		
DOS Full-Screen	0.3MB	
Additional Session	0.2MB	
DOS Window	0.3MB	
Additional Session	0.3MB	
WIN-OS/2 Session		
First Session	2.0MB	
Additional Session	1.0MB	
Printing	0.5MB	
Dynamic Data Exchange (DDE)	0.2 - 0.5MB	
Clipboard	0.2MB	
System Performance Buffer <sup>2</sup>	0.5MB	
Applications by Category <sup>3</sup>		
Communications	0.5MB	
Compilers	0.8MB	
Database	1.0MB	
Engineering/Scientific	1.0MB	
Games	0.2MB	
Graphics	1.0MB	
MMPM/2	2.0MB	
Spreadsheets	1.0MB	
Tools	0.5MB	
Utilities	0.3MB	
Word Processors	0.5MB	
Total		

**Table 3: Disk Space Requirements for Optional Features**

<b>Feature</b>	<b>Overall Size(MB)</b>	<b>Individual Size(KB)</b>	<b>User Req.</b>	<b>Space Needed(KB)</b>
Documentation -OS/2 Tutorial -REXX Command Reference -OS/2 Command Reference	0.8	177 207 427		
Fonts -Courier -Helvetica -System Monospaced -Times Roman -Courier (Outline) -Helvetica (Outline) -Times New Roman	1.9	92 233 35 215 502 395 430		
Optional system utilities -Back up the hard disk -Change file attributes -Display the directory tree -Manage partitions -Label diskettes -Link object modules -Picture Viewer -PMREXX -Recover files -Restore back-up files -Sort filter -Installation Utilities	1.6	29 37 34 228 34 472 33 85 47 30 32 501		
Tools and Games -Enhanced Editor -Search and Scan Tool -Terminal Emulator -PM Chart -Personal Productivity -Solitaire - Klondike -Reversi -Scramble -Cat and Mouse -Pulse -Jigsaw -Chess	6.0	926 71 1592 1201 1407 388 34 62 53 40 71 266		
OS/2 DOS Support (ALL) -DOS Protect Mode Interface -Virtual Expanded Memory Mgmt -Virtual Extended Memory Mgmt	1.3	22 19 8		
WIN-OS/2 Support (ALL) -README files -Accessories -Screensavers -Sound	9.0	143 1154 77 253		
HPFS support	0.4	400		
Advanced Power Management	0.1	100		
PCMCIA Support	0.1	100		
REXX	0.4	400		
Serviceability and Diagnostic Aide	0.7	700		
Optional bitmaps	0.1	100		
<b>Totals</b>				

# Appendix F: OS/2 Product History

## OS/2 Product History



NWIOS010

**4KB Paging** - A feature of OS/2 2.x that allows portions of real memory to be swapped to the hard file in 4KB blocks, or 'pages'.

**Adobe Type Manager (ATM)** - Provides WYSIWYG (What You See Is What You Get) display and printing for Type 1 fonts.

**Information Presentation Facility (IPF)** - Online help, which provides highlighted/layered text support.

**Installable File System** - Provides support for numerous file systems, including High Performance File System (HPFS) and CD-ROM support.

**MVDM** - Multiple Virtual DOS Machines. Allows for multiple DOS applications to operate concurrently in the OS/2 environment. Windows application support is provided through WIN-OS/2.

**Presentation Manager** - Primary user interface for OS/2. PM has been enhanced in OS/2 through implementation of the **Workplace Shell**, an object-oriented user environment.

OS/2 2.x fully exploits the power of the Intel 80386 family of processors, providing pre-emptive multitasking, memory management, address translation and support for both 32-bit and 16-bit applications.

## Summary Contents of OS/2 2.00.1, Service Pak XR06055, and OS/2 2.1

*Table 1. Installation and Configuration Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Installation from CD-ROM			Yes
Preloaded onto IBM and PCM systems	Yes		Yes
Enhancements to Selective Install program			Yes
Display Driver Install program	Yes		Yes
Warning on ACL Protection before Installation		Yes	Yes
Loadable ABIOS Installation	Backup diskettes	Yes	Yes

*Table 2. Hardware Support Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Additional SCSI Adapter support			Yes
Additional CD-ROM support			Yes
Loadable ABIOS support	Yes	Yes	Yes
PS/2 Server 195 and 295 support			Yes
Brazilian Keyboard support	Backup diskettes	Yes	Yes
Support for Enhanced 2.88MB Diskette Drive	Soft eject	Soft eject	Yes
Support for 3.5" Enhanced Rewritable Optical Drive			Yes
Pentium exploitation			Yes

*Table 3. Control Program Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Page tuning performance enhancements			Yes
XCOPY Enhancements	Yes	Yes	Yes
OS2VER File			Yes
Format Utility Enhanced for P-ROM Optical Disks			Yes

**Table 4. MVDM Enhancements**

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Dual-thread MVDM support	Yes	Yes	Yes
DOS_AUTOEXEC setting			Yes
DPMI 1.0 Subset support			Yes
PC Support/400 (V2R3) support			Yes
MSCDEX support			Yes

**Table 5. WIN-OS/2 3.1 Support and Enhancements**

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
WIN-OS/2 3.1 Standard Mode support			Yes
WIN-OS/2 3.1 Enhanced Compatibility Mode support			Yes
WIN-OS/2 3.1 Performance Enhancements			Yes
Seamless WIN-OS/2 display drivers for XGA, SVGA (Tseng, Headland, Western Digital, Trident, ATI, Cirrus, and IBM Speedway), 8514 and VGA			Yes
Support for Windows 3.1 printer drivers			Yes
Improved Clipboard and DDE support			Yes
Ability to start a DOS or OS/2 application from a Windows application			Yes
Inclusion of Windows 3.1 File Manager and Selected Applets			Yes
Improved WIN-OS/2 Setup and Configuration			Yes
Improved OLE Support in WIN-OS/2 3.1			Yes
Truetype Fonts in WIN-OS/2 3.1			Yes
Multimedia support for audio in WIN-OS/2 3.1			Yes



*Table 6. Presentation Manager Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
32-bit PM Graphics Engine	Yes	Yes	Yes
32-bit Seamless PM VGA display driver	Yes	Yes	Yes
32-bit Seamless PM 8514 display driver			Yes
32-bit Seamless PM SVGA IBM Speedway 256-color display driver	Yes		
32-bit Seamless PM SVGA Tseng 256-color display driver	Yes	Yes	
32-bit Seamless PM SVGA Combined 256-color display driver (Tseng, Headland, Western Digital, Trident, ATI, Cirrus, and IBM Speedway)			Yes
32-bit Seamless PM XGA display driver	Yes	Yes	Yes
ISO Font Support	Yes	Yes	Yes
Palette Manager for XGA, XGA-2, SVGA, 8514/A	Yes	Yes	Yes
XGA-2 DMQS Override	Yes	Yes	Yes

*Table 7. Workplace Shell Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Improved INI file handling			Yes
Workplace Shell Visual enhancements			Yes
Settings Notebook Drag/Drop enhancements			Yes
Auto-lockup on System Startup			Yes

*Table 8. Print Subsystem Enhancements*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Enhanced printer installation	Yes	Yes	Yes
Print Spooler enhancements			Yes
Additional and Enhanced PM printer drivers	Some	Some	Yes

*Table 9. Enhanced Support for Laptops and Notebooks*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Advanced Power Management support			Yes
PCMCIA support			Yes
Trackpoint II support	Yes	Yes	Yes
Large Cursor on VGA LCD Displays	Yes	Yes	Yes

*Table 10. Multimedia Support*

Enhancement	OS/2 2.00.1	Service Pak XR06055	OS/2 2.1
Inclusion of MMPM/2 1.1 with OS/2 2.1			Yes
Software Motion Video			Yes
Multimedia device drivers			Yes
MMPM/2 applets			Yes
MMPM/2 utilities			Yes
MMPM/2 installation			Yes
Media Control Interface subsystem			Yes
Stream Programming Interface subsystem			Yes
Multimedia I/O Services subsystem			Yes
Additional multimedia controls			Yes
Applications for MMPM/2			Yes



# Appendix G: OS/2 Product Family

## OS/2 Product Family

### OS/2 v 1.x

LAN Server
------------

LAN Server
LAN Client

LAN Server
LAN Client

### OS/2 Extended Edition

LAN Requester
Database Mgr
Comm Mgr
Base System

### Extended Services

DB Manager	Comm Manager
LAN Transport	

NTS/2
-------

Database Mgr DB2/2
-----------------------

Comm Mgr/2
------------

16 bit OS/2 Standard Edition
------------------------------------

16/32 bit Base System OS/2 2.0
--------------------------------------

MMPM/2
--------

16/32 bit Base System OS/2 2.1
--------------------------------------

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Included with the OS/2 2.1 package:

- IBM Multimedia Presentation Manager/2 adds enhanced audio, basic image support and will also provide software motion video playback capabilities.

Available separately for use with OS/2 2.0 or OS/2 2.1:

- IBM Extended Services for OS/2 includes flexible, extensive communications and database support.
- IBM Communications Manager/2 Version 1.0 provides a "no-barriers" approach to accessing information on compatible mainframes, minicomputers and personal computers.
- IBM DATABASE 2 OS/2 Version 1 is a relational database manager with SQL compatibility to add database functionality to your OS/2 workstation.
- OS/2 LAN Server Version 3.0 provides smooth resource-sharing around your LAN.
- IBM Network Transport Services/2 provides a code server to install OS/2 and many of its family products.



## Appendix H: Explanation of CONFIG.SYS Statements

### 01 IFS=D:\OS2\HPFS.IFS /CACHE:512 /CRECL:4 /AUTOCHECK:DF

This line installs the High Performance File System (HPFS) driver. Installable File System (IFS) drivers load code to manage disks and other storage media with file systems other than FAT (File Allocation Table).

The /CACHE parameter specifies the amount of memory (KB) that the HPFS file system driver will use for file system disk caching. The cache for the FAT file system is handled by the DISKCACHE= statement, line 22 in this example. The amount of cache specified in the CONFIG.SYS can have a significant impact on performance. The OS/2 installation process will select an amount of cache for the system based on the amount of installed memory, the disk size, and the file system being used. The optimum amount of cache to use will depend on the factors just mentioned and the mix of operations performed by the system. For example, an I/O intensive system, such as a server, may perform better with a larger cache.

The /CRECL parameter specifies the maximum record size (in multiples of 2KB) for caching. This value is also important for performance as it represents the maximum size an I/O block can be, and still be read into the HPFS cache.

For more information on the parameters associated with the HPFS driver, refer to the online *Command Reference*.

### 02 PROTSHELL=D:\OS2\PMSHELL.EXE

This line loads PMSHELL.EXE as the user interface program and OS/2 command processor. PROTSHELL replaces the default OS/2 command processor (CMD.EXE) with another command processor.

### 03 SET USER\_INI=D:\OS2\OS2.INI

### 04 SET SYSTEM\_INI=D:\OS2\OS2SYS.INI

### 05 SET OS2\_SHELL=D:\OS2\CMD.EXE

### 06 SET AUTOSTART=PROGRAMS,TASKLIST,FOLDERS

### 07 SET RUNWORKPLACE=D:\OS2\PMSHELL.EXE

### 08 SET COMSPEC=D:\OS2\CMD.EXE

### 09 SET PATH=D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS2; D:\OS2\INSTALL;D:\;D:\OS2\MDOS;D:\OS2\APPS;

### 10 SET DPATH=D:\OS2;D:\OS2\SYSTEM;D:\OS2\MDOS\WINOS2; D:\OS2\INSTALL;D:\;D:\OS2\BITMAP;D:\OS2\MDOS;D:\OS2\APPS;

### 11 SET PROMPT=\$i[c\$P]

### 12 SET HELP=D:\OS2\HELP;D:\OS2\HELP\TUTORIAL;

### 13 SET GLOSSARY=D:\OS2\HELP\GLOSS;

These lines set OS/2 system variables stored in the OS/2 environment. The environment is a special place in storage used by the operating system and applications to store and look up values of variables. DOS sessions and OS/2 sessions operate independently; therefore each command processor that starts a session can have its own environment.

The main change from OS/2 1.3 is the inclusion of some variables used by the Workplace Shell; these are set in lines 3 through 7.

**14 LIBPATH=.;D:\OS2\DLL;D:\OS2\MDOS;D:\;D:\OS2\APPS\DLL;**

This sets the LIBPATH variable. It is used to identify a set of directories to be searched when OS/2 loads dynamic link libraries. LIBPATH is not a part of the environment and therefore cannot be viewed with the SET command. Also, unlike the PATH environment variable, the current directory is not selected first. The entry “.” at the beginning of the LIBPATH statement is used to force OS/2 to search the current directory.

**15 PRIORITY\_DISK\_IO=YES**

Specifies disk input/output priority for applications running in the foreground. When PRIORITY\_DISK\_IO=YES is specified, applications running in the foreground will receive disk I/O priority over applications running in the background.

**16 FILES=20**

Determines the maximum number of files available in DOS sessions. Regardless of the FILES= setting, all DOS programs are initialized to a maximum of 20 files. It is the responsibility of an application to increase the number of files up to the maximum set by the FILES= statement. Each DOS session can also be customized by changing the appropriate DOS setting. This statement has no effect on OS/2 sessions.

**17 DEVICE=D:\OS2\TESTCFG.SYS**

**18 DEVICE=D:\OS2\DOS.SYS**

**19 DEVICE=D:\OS2\PMDD.SYS**

Install device drivers using the DEVICE= statement. Both DOS and OS/2 device drivers can be loaded with this statement. OS/2 device drivers are initialized when you start OS/2 and can process requests from either DOS or OS/2 programs. DOS device drivers are also initialized when you start the OS/2 operating system but they can only process requests from DOS programs.

TESTCFG.SYS is a new device driver in OS/2 which is used during the install process to test the system configuration. This DEVICE statement should not be removed from the CONFIG.SYS as it is also used by the selective install process and during device driver installation.

**20 BUFFERS=30**

Sets the number of disks buffers the system will keep in memory. Each buffer uses 512 bytes of available memory. If you run many programs in OS/2 sessions, you can increase the speed of your system by increasing the value specified for BUFFERS (for example, BUFFERS=70). However, remember that when you increase the number of disk buffers, you decrease the available memory by 512 bytes for each buffer specified. In memory-constrained systems (4MB) reduce the number of buffers to 20.

**21 IOPL=YES**

Allows I/O privilege to be granted to requesting processes in OS/2 sessions.

**22 DISKCACHE=512,LW**

Specifies the number of blocks of storage (KB) allocated to a FAT file system cache. This parameter can have a marked effect on performance. See the comments on line 01 of this example CONFIG.SYS and also the online *Command Reference* for more information on the parameters associated with DISKCACHE.

**23 MAXWAIT=3**

Sets the amount of time, in seconds, a process waits before the system assigns it a higher priority. The most appropriate length of time to set MAXWAIT to depends on the number of applications that must run concurrently and the kinds of activities the applications perform. The default is 3 seconds.

**24 MEMMAN=SWAP,PROTECT**

This line specifies the various memory management options for the OS/2 environment. SWAP enables the use of protected memory by DLLs. There is also the MOVE/NOMOVE parameter which has no effect under OS/2 and is provided for compatibility with OS/2 1.3.

**25 SWAPPATH=D:\OS2\SYSTEM 2048 2048**

The swap file (SWAPPER.DAT) is used to temporarily store pages that the system has removed from memory in order to free up space to satisfy page-in requests generated as a result of page faults. If paging is enabled, this command specifies the location and the initial size of the swap file. The first parameter specifies the amount of disk space (in KB) at which the system will begin to warn you that there is less than this amount of space left on the partition containing your SWAPPER.DAT file. The second parameter specifies the size of the swapper file (in KB) initially allocated at the time OS/2 is started.

**26 BREAK=OFF**

The Ctrl-Break key sequence will stop a command from completing its task. The BREAK parameter instructs the system to check if you pressed Ctrl-Break before the system carries out a program request. BREAK=ON



could decrease overall performance, but means the operating system will generally intercept Ctrl-Break faster.

**27 THREADS=256**

This specifies the maximum number of threads available to OS/2 and its applications. The maximum that can be specified here is 4095. Normally the system default of 256 is sufficient. In memory constrained systems (4MB) reduce this to 128.

**28 PRINTMONBUFSIZE=134,134,134**

This sets the parallel-port device-driver buffer size. Each number corresponds to the buffer size for LPT1, LPT2, and LPT3 respectively. The minimum value that can be specified is 134 bytes and the maximum is 2048 bytes. The system will default to 134 bytes if PRINTMONBUFSIZE is not specified or is out of range. Changing these values will allow you to increase the size of the parallel-port device-driver buffers and thereby increase performance of data transfer to devices connected to the parallel ports.

**29 COUNTRY=001,D:\OS2\SYSTEM\COUNTRY.SYS**

This specifies the country code and the file containing the country information used. This information is selected by the user at installation. Refer to the online *Command Reference* for more information on code page switching.

**30 SET KEYS=ON**

This permits commands issued at the OS/2 command prompt to be retrieved later and reissued and/or edited.

**31 REM SET DELDIR=C:\DELETE,512;D:\DELETE,512;E:\DELETE,512;  
F:\DELETE,512;G:\DELETE,512;**

The DELDIR environment variable is used by the UNDELETE command. DELDIR specifies a path used to store files that have been DELETED or ERASEd. A separate directory and maximum directory size must be specified for each logical disk. Installation will add an appropriate DELDIR statement to the CONFIG.SYS but REMarks it out. To enable UNDELETE, remove the 'REM' from the beginning of this line.

**32 BASEDEV=PRINT02.SYS**

**33 BASEDEV=IBM2FLPY.ADD**

**34 BASEDEV=IBM2SCSI.ADD /LED**

**35 BASEDEV=OS2SCSI.DMD**

**36 BASEDEV=OS2DASD.DMD**

A *device driver* is a file that contains the code that the OS/2 operating system needs to recognize a device and correctly process information received from or sent to that device. A *base driver* is one that is needed when the OS/2 operating system is first started. The BASEDEV statement is used to load base device drivers. Device support for disks, diskettes, printers connected to the workstation, and other devices, is loaded with the

**BASEDEV statement.**

Unlike the DEVICE statement, the BASEDEV statement cannot contain either drive or path information because the OS/2 operating system cannot process such information at the stage of the startup sequence when the BASEDEV statements are processed. The root directory of the startup partition is first searched for the specified file name, then the \OS2 directory of the startup partition. If drive or path information is included in a BASEDEV statement, an error is generated.

In addition, BASEDEV statements are not necessarily processed in the order in which they appear in your CONFIG.SYS file. The extensions of the file names specified in the BASEDEV statements are examined; the statements are then processed in the following order of file name extensions: .SYS, .BID, .VSD, .TSD, .ADD, .I13, .FLT, then .DMD.

These lines install base device drivers for the following:

PRINT02.SYS	Device support for locally attached printers on Micro Channel* workstations.
IBM2FLPY.ADD	Device support for diskette drives on Micro Channel workstations.
IBM2SCSI.ADD	Device support for Micro Channel SCSI adapters. The /LED parameter is only applicable when running on a PS/2* Model 95 and, if present, the device driver will use the system information display panel to simulate a disk activity light.
OS2SCSI.DMD	General purpose device support for non-disk SCSI devices.
OS2DASD.DMD	General purpose device support for disk drives.

In addition, OS/2 includes the following base device drivers:

PRINT01.SYS	Device support for locally attached printers on non-Micro Channel workstations.
IBM1FLPY.ADD	Device support for diskette drives on non-Micro Channel workstations.
IBM1S506.ADD	Device support for non-SCSI disk drives on non-Micro Channel workstations.
IBM2ADSK.ADD	Device support non-SCSI disk drives on Micro Channel workstations.
IBMINT13.I13	General purpose device support for non-Micro Channel SCSI adapters.

**37 REM IFS=D:\OS2\CDFS.IFS /Q**

**38 REM DEVICE=D:\OS2\CDROM.SYS /Q /I N:4**

These lines contain the CD-ROM file system IFS driver and the IBM CD-ROM device driver for OS/2. If CD-ROM device support was selected at the OS/2 Setup and Installation screen during installation, then these lines will be present. Refer to the online *Command Reference* for an explanation of the parameters used.

**39 SET BOOKSHELF=D:\OS2\BOOK**

**40 SET EPATH=D:\OS2\APPS**

These lines set two more environment variables used by OS/2 or applications. For example, The BOOKSHELF environment variable points to the path of the system .INF files. These files are used by the system VIEW.EXE.

**41 DEVICE=D:\OS2\APPS\SASYNCD.B.SYS**

The SASYNCDx.SYS device driver loads the asynchronous communications device interface (ACDI) support for the PM Terminal program. If the PMTerminal program was not installed, this line may be REMarked out. If this is the case, delete "REM" from the beginning of the line to enable ACDI support. Remember, after changes are made to the CONFIG.SYS the system needs to be rebooted for the changes to come in effect. Refer to the online *Command Reference* entries for Device Driver (COM.SYS) for an explanation of how device drivers such as SASYNCH.SYS and COM.SYS are used.

**42 PROTECTONLY=NO**

This line allows OS/2 to run both DOS and OS/2 processes. If only OS/2 applications are required, specify PROTECTONLY=YES.

**43 SHELL=D:\OS2\MDOS\COMMAND.COM D:\OS2\MDOS /P**

The SHELL= line specifies the DOS command processor (COMMAND.COM), or allows you to replace the DOS command processor with another command processor. In this example, we are loading and starting the DOS COMMAND.COM processor. The parameters following it are specific to the command processor. In this case the parameters are the path for COMMAND.COM and /P, which is used to retain COMMAND.COM in storage. The SHELL= statement does not affect either the OS/2 SET command, or the SHELL command in BASIC.

**44 FCBS=16,8**

**45 RMSIZE=640**

**46 DEVICE=D:\OS2\MDOS\VEMM.SYS**

**47 DEVICE=D:\OS2\MDOS\VMOUSE.SYS**

**48 DOS=LOW,NOUMB**

**49 DEVICE=D:\OS2\MDOS\VDPX.SYS**

**50 DEVICE=D:\OS2\MDOS\VXMS.SYS /UMB**

**51 DEVICE=D:\OS2\MDOS\VDPMI.SYS**

**52 DEVICE=D:\OS2\MDOS\VWIN.SYS**

**53 DEVICE=D:\OS2\MDOS\VCDROM.SYS**

Lines 44 through 53 are needed to configure and load drivers for the DOS environment.

The first line sets the file control block (FCB) management information for DOS sessions. An FCB is a record that contains all of the information about

a file (for example, its structure, length, and name). If a program tries to open more than the number of files specified in the FCBS statement, the system closes the least recently used file control block and opens the new file. This parameter should not need to be changed and has no effect on OS/2 sessions.

The RMSIZE= statement specifies the highest storage address allowed for the DOS operating environment. In certain circumstances this can be used to limit the size of the DOS environment.

In line 48, the DOS= parameter specifies whether the DOS kernel will reside in the high memory area (HMA) and whether the operating system or DOS applications will control upper memory blocks (UMBs). The HMA refers to space between 1MB and 1MB + 64KB and UMBs reside between 640KB and 1MB.

If DOS=HIGH/LOW,UMB is specified in CONFIG.SYS, then the operating system controls the UMBs. This means that DOS applications can be loaded into upper memory but cannot allocate UMBs.

On the other hand, if DOS=HIGH/LOW,NOUMB is specified in CONFIG.SYS, then the operating system will not control any UMBs and DOS applications can allocate UMBs but cannot be loaded there.

Lines 46, 47, and 49 through 53 contain the device drivers for the virtual DOS/Windows environment. More information on these specific drivers and a complete discussion of tailoring the DOS environment under OS/2 may be found in *OS/2 Version 2.0 - Volume 2: DOS and Windows Environment*.

```

54  DEVINFO=SCR,VGA,D:\OS2\VIOTBL.DCP
55  SET VIDEO_DEVICES=VIO_VGA
56  SET VIO_VGA=DEVICE(BVHVGA)
57  DEVICE=D:\OS2\MDOS\VVGA.SYS
58  DEVICE=D:\OS2\MDOS\V8514A.SYS

```

These lines configure the display environment under OS/2.

The DEVINFO= statement in line 54 is used to prepare a device such as a keyboard (KBD), display terminal (SCR), or printer (LPTx) for code page switching. Separate DEVINFO statements are required for each device to be used for codepage switching.

This line prepares the display screen for codepage switching. The display statement specifies your display name and a file named VIOTBL.DCP that contains a video font table for displaying characters in each of the codepages supported by the system.

Lines 55 and 56 set environment variables related to the display driver being used.

Lines 57 and 58 load virtual device drivers for the VGA and 8514/A devices for use by the DOS/WINDOWS environment. In this example, the user specified VGA resolution with an 8514/A adapter installed.

Adding or changing your display adapter support after installation can be performed automatically using the OS/2 selective install

process. A complete description of how this is done can be found in the *Master Help Index* under adding display adapter support.

**59     DEVICE=D:\OS2\POINTDD.SYS**

**60     DEVICE=D:\OS2\MOUSE.SYS**

POINTDD.SYS provides mouse-pointer draw support in all text modes for OS/2 sessions. To function, an appropriate mouse device driver must also be loaded. In this example, this is done in line 60 with the MOUSE.SYS driver. These two lines will provide support for a PS/2-style mouse. If the pointing device used was a Microsoft mouse attached to the COM1 port, line 60 would change to:

**60     DEVICE=D:\OS2\MOUSE.SYS SERIAL=COM1**

Some pointing devices such as the Logitech mouse need a device-dependent device driver as well as the MOUSE.SYS device-independent device driver.

Refer to the online *Command Reference*, if installing support for a pointing device not directly supported by the OS/2 installation procedure.

**61     DEVICE=D:\OS2\COM.SYS**

**62     DEVICE=D:\OS2\MDOS\VCOM.SYS**

The COM.SYS device driver supports ports COM1, COM2, COM3, and COM4. It does not provide support for specific devices that are attached to the COM port. Instead, it provides enabling support for the asynchronous communications interface itself. Application programs, subsystems, and system programs must provide the support needed to use devices attached to the COM port. VCOM.SYS is a virtual device driver that provides support in DOS sessions for up to four COM ports.

**NOTE:**

The COM.SYS device driver is used for all IBM PS/2 models. There is no COMDMA.SYS device driver for the IBM PS/2 Models 90 and 95, as described in the online *Command Reference*.

Some devices which attach to the COM ports provide their own device drivers. COM.SYS allows other device drivers which support COM ports to be installed, provided they are listed in the CONFIG.SYS before COM.SYS. When COM.SYS is loaded, it will claim all COM ports not already allocated to other device drivers.

In the following example, DEVCOM1.SYS uses COM1, and PRINTER4.SYS uses COM4. COM2 and COM3 are available for use by COM.SYS.

**DEVICE=D:\OS2\DEVCOM1.SYS**

**DEVICE=D:\OS2\PRINTER4.SYS**

**DEVICE=D:\OS2\COM.SYS**

**63     CODEPAGE=437,850**

**64     DEVINFO=KBD,US,D:\OS2\KEYBOARD.DCP**

Line 63 sets the system codepages (defined character sets) to be prepared by the OS/2 operating system for codepage switching. Line 64 is the DEVINFO specification for the keyboard. It specifies the keyboard layout and a file named KEYBOARD.DCP that contains a keyboard layout table for translating keystrokes into the characters of each codepage supported by the system. Codepage support in OS/2 2.1 is similar to that provided under previous versions of OS/2. More information on DEVINFO and CODEPAGE can be found in the online *Command Reference*.



# Bibliography

**OS/2 Book Collection (CD-ROM)****Part Number: 53G2166**

Contains over 100 OS/2-based product manuals, white papers and product related publications. Call 1-800-426-7282 for order information. Many of the books listed below are included.

**OS/2 2.1 Command Reference****Part Number: 71G4112**

The online version of this book, located in the Information folder, is shipped with the operating system. This version is made available for persons who prefer a hardcopy book. As in the online version, this book describes how to use OS/2 commands and has information about the syntax and purpose of each command.

**OS/2 2.0 Tips and Techniques****Part Number: 53G1930****OS/2 Information and Planning Guide****Part Number: 0**

This book provides product and planning information about IBM OS/2 2.1. It is designed to be an information and planning source for administrative personnel, technical and service support personnel, service coordinators, and IBM personnel, as well as anyone who may have responsibility for making decisions on information systems.

**OS/2 2.1 Technical Update (Used with Vol. 1-5 listed below.)****Part Number: SG24-3948**

This book is provided as an information source for the people installing and using OS/2 2.0. Some information in this book is intended for the more advanced user or for the user already familiar with various functions provided with OS/2 2.0. This book, when used with Volumes 1-5 listed below, is a complete technical reference for OS/2 2.1. The 6 books can be ordered as the *OS/2 2.1 Redbook for Power Users*. Call 1-800-3IBMOS2.

**OS/2 Version 2.0 Volume 1: Control Program****Part Number: 52G9938**

This book provides detailed information about the Control Program component of OS/2 2.0. It describes memory and task management, debugging support, and enhanced application programming interfaces. This book also describes installation and national language considerations, and discusses enhanced support.



**OS/2 Version 2.0 Volume 2: DOS and Windows Environment**  
**Part Number: 52G9939**

This book provides detailed information about the Multiple Virtual DOS Machines feature, and support for Microsoft Windows. It describes 8086 emulation, device drivers, extended memory support, DOS settings, using specific versions of DOS, and the architecture of Multiple Virtual DOS Machines. This book also provides technical information about using Microsoft Windows programs and DOS Protect Mode Interface (DPMI).

**OS/2 2.0 Version 2.0 Volume 3: Presentation Manager**  
**Part Number: 52G9940**

This book provides an overview of the Presentation Manager component of OS/2 2.0. It introduces the Presentation Manager, describes the enhanced graphical appearance of the OS/2 2.0 operating system, and the enhanced help facilities. The book also discusses programming considerations for 32-bit or a mix of 16-bit and 32-bit code application development. It describes how to migrate existing 16-bit applications and describes the support for national languages and double-byte character sets.

**OS/2 2.0 Version 2.0 Volume 4: Application Development**  
**Part Number: 52G9941**

This book provides a general introduction to object-orientation, modularization, naming conventions, and other structural considerations for programs designed to run in the OS/2 environment. It also discusses programming and migration considerations for 32-bit, 16-bit, and mixed applications.

**OS/2 2.0 Version 2.0 Volume 5: Print Subsystem**  
**Part Number: 52G9942**

This book describes the internal workings of the print subsystem, including the spooler.

**OS/2 2.0 Remote Installation and Maintenance**  
**Part Number: 52G9943**

This book provides instructions for installing OS/2 2.0 from a local area network (LAN).

**OS/2 2.0 Version 2.0 Migrating from a DOS/Windows Environment to OS/2 2.0 -  
Porting Windows Applications to OS/2 2.0**  
**Part Number: 52G9944**

The first part of this book describes the process of migrating from DOS with Windows. The second part describes the process of porting Windows application source code to OS/2 2.0 and is intended for programmers and application developers.

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**Application Design Guide**  
**Part Number: 10G6260**

This book provides an overview of the programming concepts supported by OS/2 2.0. In more general terms than the Programming Guide, it introduces significant aspects of programming in the 32-bit OS/2 environment. Use this book writing code for an object-oriented environment, or when migrating from OS/2 16-bit applications.

**Programming Guide Volume I**  
**Part Number: 10G6461**

Three volumes provide guidance information and code examples to enable you to start writing source code using the application programming interfaces (APIs) OS/2 2.0 provides.

Volume I describes the Control Program for programming functions that are internal to applications, including file system, memory management, exception management, and multitasking functions.

**Programming Guide Volume II**  
**Part Number: 10G6494**

Volume II describes the Presentation Manager windowed user interface, including messages and message queues, window classes, frame windows, control windows, and window controls.

**Programming Guide Volume III**  
**Part Number: 10G6495**

Volume III describes the graphics programming interface, including graphic primitives, and graphics segments, bitmaps, and transformation functions. This volume also describes printing and device support.

**Control Program Programming Reference**  
**Part Number: 10G6263**

Refer to this book for functions of the base operating system (functions with a prefix of DOS). Dos functions are listed in alphabetic order. Each one includes a C-language code example and pointers to related functions. This information is also available online in the CP Reference.

**Presentation Manager Programming Reference, Volume I**  
**Part Number: 10G6264**

Three volumes provide a detailed reference for programming to the Presentation Manager interface.

Volume I has an alphabetic listing of the Dev (device), Drg (drag), Gpi (graphics), Prf (profile), and Spl (spooler) API functions.

**Presentation Manager Programming Reference Volume II**  
**Part Number: 10G6265**

Volume II has an alphabetic listing of the Win(window) API functions and the new WP (workplace) methods.

**Presentation Manager Programming Reference Volume III**  
**Part Number: 10G6272**

Volume III contains related information such as graphics-orders, graphics-orders data types, application hooks and procedures, and Presentation Manager messages. This information is also available online in the PM Reference.

**Information Presentation Facility Guide and Reference**  
**Part Number: 10G6262**

This book is for both the application programmer designing help windows, as well as for an author developing online documents. It provides guidance in using the Information Presentation Facility (IPF) tagging language and the IPF compiler, and serves as a reference for window functions, dynamic data functions, and help manager messages. This information is also available online in the IPF Reference.

**System Object Model Guide and Reference**  
**Part Number: 10G6309**

This book describes the System Object Model (SOM), and the tools that support its use. The book is aimed primarily at the experienced C-language programmer. It covers the basic structure of SOM, how SOM programs are developed, the Object Interface Definition Language (OIDL), the SOM compiler, the C-language bindings, and the SOM programming interface functions. This information is available online in the SOM Reference.

**Procedures Language 2/REXX User's Guide**  
**Part Number: 10G6269**

This book describes the REXX language. Each chapter is divided into two sections: Basic includes frequently-used features, and Advanced Topics describes special features and includes examples. The book is intended for users who want to learn how to program in REXX.

**Procedures Language 2/REXX Programming Reference**  
**Part Number: 10G6268**

Refer to this book for a list of the REXX functions supported by the OS/2 operating system. The book is a more detailed description of the REXX programming language. The book contains detailed descriptions of C language APIs for those who wish to extend their applications with REXX as a macro language.

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**Physical Device Driver Reference**  
**Part Number: 10G6266**

Use this book to write OS/2 physical device drivers. It provides category, function code, and calling conventions for I/O control (IOCtl) functions. Calling conventions also are described for DevHlp routines. This book is written for system programmers as well as application programmers.

**Virtual Device Driver Reference**  
**Part Number: 10G6310**

This book is for writing virtual device drivers and provides information on virtual DevHlp routines. It describes virtual device driver architecture, operations, and inter-device driver communications. It also describes each virtual device driver shipped with OS/2 2.0. This book is written for system programmers as well as application programmers.

**Presentation Driver Reference**  
**Part Number: 10G6267**

This book is for experienced system programmers who are developing presentation drivers for devices operating in an OS/2 program environment. It describes the internal interface between Presentation Manager and the driver, and between the driver and the I/O subsystem. This book also contains information about queue drivers and port drivers. Detailed descriptions of control structures, data structures, and I/O formats are included.

**OS/2 2.0 Technical Library**

This library is designed for application developers and device driver developers. The guidance information provides a complete guide to designing, writing, and building your application. The reference information is for all the application programming interface (API) functions. The library contains all of the following books. You can purchase the entire library as a single package or only individual books from the library. None of these items is included when you purchase "Developer's Toolkit for OS/2 2.0."

**OS/2 2.1 Keyboards and Code Pages**  
**Part Number: 71G4113****OS/2 2.1 Bi-Directional Manual**  
**Part Number: 71G4114****MMPM/2 Application Program Guide V 1.1**  
**Part Number: 71G2221****MMPM/2 Programming Reference V 1.1**  
**Part Number 71G2222****MMPM/2 Subsystem Developer's Guide V 1.1**  
**Part Number: 71G2223**



# Glossary

## A

**ABIOS.** Code that controls basic hardware operations such as interactions with diskette drives, hard disk drives, and the keyboard. See also BIOS.

**attribute.** A characteristic or property of a file, directory, or object; for example, its size, last modification date, or flag.

**AUTOEXEC.BAT.** A batch file whose main purpose is to process commands that set up the operating system for DOS sessions.

## B

**background.** In multiprogramming, the conditions under which low-priority programs run when high-priority programs are not using the system resources. A background session runs one program step at a time. It does not run interactively with the user; processing continues on other sessions in the foreground.

**batch file.** A file that contains a series of commands to be processed sequentially. A batch file can have either a CMD or a BAT extension.

**BIOS (basic input/output system).** Code that controls basic hardware operations such as interactions with diskette drives, hard disk drives, and the keyboard.

**bitmap.** Method of displaying graphical data as a raster image. A bitmap is created by representing each point in a picture by one or more bits which indicate various properties (color, tone, etc.) of that point.

**byte.** A group of eight adjacent binary digits that are treated as a unit, and that often represent a character.

**Boot Manager.** Feature of OS/2 Version 2.+ which allows multiple partitions to exist on fixed disks in the same machine, with a separate operating system on each partition. At boot time, the user may select the desired operating system with which to start the machine.

## C

**cache.** A storage buffer that contains frequently accessed instructions and data; it is used to reduce hard disk access time.

**CD-ROM.** High capacity, read-only memory in the form of an optically read compact disc.

**clipboard.** A area of memory that temporarily holds data being passed from one program to another. Data is placed on the clipboard by selecting from a menu.

**CONFIG.SYS.** A file that the operating system adds to the root directory during installation. This file contains statements that set up the system configuration each time you restart the operating system.

## D

**DASD (Direct Access Storage Device).** Used to refer to a hard disk or CD-ROM.

**desktop.** A folder that fills the entire screen and holds all of the objects that enable you to interact with and perform operations on the system.

**device driver.** A program that contains the code needed to attach and use a device, such as a display, plotter, printer, or mouse. The driver might also include data such as help information.

**DLL (Dynamic Link Library).** Application module containing routines and/or resources, which is dynamically linked with its parent application at load time or runtime rather than during the linkage editing process. The use of DLLs enables decoupling of application routines and resources from the parent program, enhancing code independence, facilitating maintenance and reducing resident memory consumption.

**DOS.** Disk operating system; generally used in reference to IBM PC DOS, the single-tasking, 16-bit, real-mode operating system designed for Intel 8086 processors, and developed by Microsoft\*\* Corporation as MS-DOS\*\* in the early 1980s. IBM subsequently licensed MS-DOS for use on IBM Personal Computer and Personal System/2 machines, and has since undertaken joint development of later versions of the operating system in conjunction with Microsoft.

**DOS session.** A session created by the OS/2 operating system that supports the independent execution of a DOS program. The DOS program appears to run independent of any other programs in the system.

**dynamic data exchange.** The exchange of data between programs or between a program and a data-file object. Any change you make to information in one program or session is applied to the identical data created by the other program. For example, with the dynamic data exchange (DDE) feature enabled, you can select the duplicate of a spreadsheet that is embedded in a report. Then, if you make changes to the spreadsheet copy in the report, the same changes are made to the original spreadsheet file.

## E

**environment variables.** A series of commands placed in the AUTOEXEC.BAT and CONFIG.SYS files that dictate the way the operating system is going to run and what external devices it is going to recognize. These commands also can be specified as settings of DOS programs.

**extended attributes.** Information which may be associated with a file under OS/2 Version 1.2 or above to indicate various properties of that file. Extended attributes are available with both the FAT and HPFS file systems. An application may define extended attributes for files which it creates, and may update the extended attributes of files upon which it operates. A number of standard extended attributes are defined by the operating system for commonly-used information. Extended attributes and their uses are described in the *IBM OS/2 Version 2.0 Control Program Reference*.

## F

**file allocation table (FAT).** A table used by DOS to allocate disk space for a file. It also locates and chains together parts of the file that may be scattered on different sectors so that the file can be used in a random or sequential manner. Contrast with High Performance File System (HPFS).

**file name.** (1) The name used by a program to identify a file. (2) When referring to the file allocation table (FAT) file system, the file name is the portion of the identifying name that precedes the extension. When referring to the high performance file system (HPFS), the file name includes an extension (if there is one).

**flag.** A characteristic of a file or directory that enables it to be used in certain ways.

**font.** A particular style (shape), size, slant, and weight, defined for an entire character set; for example, 9-point Helvetica italic bold. When applied to outline or scalable character sets, which can be scaled to any size, font refers to style, slant, and weight, but not to size.

**format.** To check a hard disk or diskette for defects and prepare it to hold information.

## H

**hard disk.** A rigid disk in a hard disk drive that you cannot remove. The hard disk can be partitioned into storage areas of variable sizes that are subdivided into directories and subdirectories.

**HPFS (High Performance File System).** File system first implemented under OS/2 Version 1.2, offering enhanced performance over the original FAT file system implemented in DOS and prior versions of OS/2. HPFS is an optional installation item under OS/2 Version 2.0; the FAT system may also be used to retain compatibility with DOS.



## I

**image file.** A file that is created from a DOS startup diskette. The image file is a copy of the information on the startup diskette. Just as a DOS session can be started from a DOS startup diskette, a DOS session can be started from an image file of that same diskette.

**install.** (1) To physically copy the files from the shipped diskettes of an operating system, or program to specified areas (directories) of a hard disk. (2) Installing a printer driver, queue driver, or port means adding the driver to the INI file (and copying to the hard disk only if required). Deleting a printer driver, queue driver, or port removes the entry from the INI file, but leaves the program file on your hard disk.

**I/O (Input/Output).** Term used to collectively describe the techniques and devices through which a computer system interfaces with storage devices, external systems and the user.

**IPL (Initial Program Load).** The system boot process.

## K

**kernel.** (1) The part of an operating system that performs basic functions such as allocating hardware resources. (2) A part of a program that must be in main storage in order to load other parts of the program.

**kernel device driver.** Physical device driver which interfaces with the port to which a printer device is attached. The kernel device driver performs the actual transmission of data through the port.

## L

**logical drive.** In the context of Boot Manager, a subdivision of a fixed disk partition, which is regarded by an operating system as a logical entity. Logical drives are typically accessed using logical drive letters (for example, "D"). Logical drives are used to store operating system code, programs and data files. A primary partition may only contain a single logical drive, which an extended partition may contain multiple logical drives.

## M

**memory.** (1) The storage on electronic chips; for example, random access memory, where your programs and data are held while you use them, or read-only memory where information is stored that your system can refer to but not change. (2) Program-addressable storage; the locations by which the operating system and your programs can locate information that is temporarily held in memory. With the OS/2 operating system, program-addressable memory might be larger than the electronic chip memory in your computer.

**microprocessor.** An integrated circuit that contains the central processing unit (CPU) of a computer.

**migrate.** (1) To move to a changed operating environment, usually to a new release or version of a system. (2) To move data from one hierarchy of storage to another.

**multiple DOS sessions.** A system service that coordinates the concurrent operation of separate DOS sessions.

**Multiple Virtual DOS Machines (MVDM).** Feature of OS/2 Version 2.0+ which enables multiple DOS applications to execute concurrently in full-screen or windowed mode under OS/2 Version 2.0+ in conjunction with other 16-bit or 32-bit applications, with full preemptive multitasking and memory protection between tasks.

**multitasking.** A mode of operation that provides for concurrent performance, or interleaved execution of two or more tasks.

## O

**operating system.** Software that controls the processing of programs and that may provide services such as resource allocation, scheduling, input/output control, and data management. Although operating systems are predominantly software, partial hardware implementations are possible.

**OS/2 command prompt.** A displayed symbol that indicates where you enter commands. The OS/2 command prompt is displayed in an OS/2 window or OS/2 full screen.

## P

**PARSEDB.** A utility program that creates a similar database to the Migrate Applications default database (DATABASE.DAT). The Migrate Applications program uses information in this database when migrating programs. The database you create with PARSEDB contains similar information to the default database, but for different programs.

**partition.** A fixed-size division of storage. On a personal computer hard disk, one of four possible storage areas of variable size; one might be accessed by DOS, and each of the others might be assigned to another operating system.

**path.** A statement that indicates where a file is stored on a particular drive. The path consists of all the directories that must be opened to get to a particular file. The directory names are separated by the backslash (\). The first backslash represents the root directory. For example, a file named *things* that is located in the EDIT directory of drive C has a path of: c:\edit\things. A path is sometimes followed by a file name and a file name extension (if there is one). It is sometimes preceded by a drive letter and a colon(:).

**path and file name.** The path and file name make up a statement that indicates where a file is stored in a particular drive. It consists of all the directories that must be opened to get to a particular file. The backslash (\) separates directory names and the file name; the first \ indicates the root. File names in the HPFS file system can be up to 254 characters

and can include any number of periods. The following is an example:

\\INCOME\\SALES.FIGURES.FOR.SEPTEMBER. File names in the FAT file system can be up to eight characters and can be followed by an optional three-character extension. The following is an example: \\INCOME\\TAX\\SALES.TXT.

**port.** A connector on a computer to which cables for devices, such as display stations and printers, or communications lines are attached. Ports can be parallel or serial.

**primary partition.** In the context of Boot Manager, a fixed disk partition which contains a single logical drive, and on which an operating system may be installed. Only one primary partition may be active (visible) on a fixed disk at any one time; other primary partitions are hidden from the operating system. Operating systems such as DOS and OS/2 Version 1.x require a primary partition for their installation; OS/2 Version 2.0+ may be installed on a primary partition or an extended partition.

**printer driver.** A file that describes the physical characteristics of a printer, plotter, or other peripheral device, and is used to convert graphics into device-specific data at the time of printing or plotting. A Presentation Manager printer driver allows you to print or plot from an application program that creates printer-independent files.

**printer-independent file.** A file in a format that is independent of a particular printer type. For example, with the Presentation Manager spooler, a file in the metafile format is printer-independent.

**printer object.** An object representing a physical printer or plotter, its printer driver, queue, and other settings.

**printer-specific file.** A file that can be printed on only one type of printer.

**protected mode.** Mode of operation for the Intel 80286 and 80386/80486 processors, whereby the address space is expanded to 16MB (80286) or 4GB (80386/80486), and memory references are translated via segment selector and offset, enabling full memory protection between processes executing in the system. With the 80386/80486, paging is available in protected mode.

## Q

**queue.** A line or list formed by items waiting to be processed; for example, a list of print jobs waiting to be printed.

**queue driver.** A software processor that takes a print job from a queue, and sends it to the appropriate printer driver to prepare it for printing.

## R

**RAM (Random Access Memory).** A memory device into which data is entered and from which data is retrieved in a nonsequential manner.

**real mode.** Default mode of operation for the Intel 80286 and 80386 processors, and the only mode of operation for the 8086 processor. In real mode, the processor acts as a 16-bit device, its physical memory address space is limited to 1MB, and memory references translate directly to physical addresses. With the 80386, paging is not supported in real mode.

**ROM (Read-Only Memory).** Term used to describe memory which may be read, but not written to, during system operations. ROM is typically used to store basic hardware initialization instructions, BIOS or self-testing code, which is required to be available prior to accessing the disk subsystem.

## S

**SCSI (small computer system interface).** A standard input/output interface used by personal computers.

**seamless.** Refers to running Windows and DOS applications on the desktop along with OS/2 applications.

**session.** One instance of a started program or command prompt. Each session is separate from all other sessions that might be running on the computer. The operating system is responsible for coordinating the resources that each session uses, such as computer memory, allocation of processor time, and windows on the screen. The session types are OS/2 window, OS/2 full screen, DOS window, DOS full screen, WIN-OS/2 full screen, WIN-OS/2 window, and WIN-OS/2 window separate session.

**specific DOS.** An actual DOS program product that is purchased independently of the OS/2 operating system. Examples include IBM DOS Version 3.x or Microsoft DOS Version 3.x. Some programs are dependent on the internals of a specific DOS version. You can run these programs with the OS/2 operating system by starting a DOS session with a specific DOS version.

**spooler.** A program that intercepts data going to a device driver and writes it to disk. The data is later printed or plotted when the required device is available. A spooler prevents output from different sources from being intermixed.

**spooling.** The process of temporarily storing print jobs while waiting for an available printer or port. Spooling jobs frees system resources from waiting for a relatively slow device to provide output, and keeps the contents of each print job separated from the contents of every other print job.

## V

**virtual device driver.** A type of device driver used by DOS programs running in a DOS virtual machine, in order to access devices such as the screen or mouse which must be shared with other processes in the system. The virtual device driver maps DOS device commands to the normal (physical) device driver under OS/2 Version 2.1.

**virtual DOS machine.** A protected mode process under OS/2 Version 2.0+ which emulates a DOS operating system environment, such that DOS applications executing within the virtual machine operate exactly as if they were running under DOS. DOS virtual machines support both text and graphics applications. Virtual DOS machines make use of the virtual 8086 mode of the 80386 and 80486 processors.

**virtual 8086 mode.** Mode of operation of the Intel 80386/80486 processors, which allows the processor to execute multiple concurrent tasks with each regarding the processor as its own distinct 8086 processor. This mode of operation provides full preemptive multitasking and full memory protection between the virtual 8086 tasks.

## W

**WIN-OS/2.** WIN-OS/2 is a feature of OS/2 2.1 that enables OS/2 2.1 to run supported Windows programs.

**WIN-OS/2 session.** A WIN-OS/2 session created by the OS/2 2.1 operating system that supports the independent processing of a Windows program. The Windows program can run in a WIN-OS/2 full-screen, WIN-OS/2 window, or WIN-OS/2 window separate session.

**Workplace shell.** A graphical user interface that makes working with your computer easier. The Workplace shell lets you manage your work without having to learn the complexities of the operating system.

**16-bit.** Term used to describe an application which uses the 16:16 addressing scheme implemented under DOS and previous versions of OS/2. In fact, such applications use a 24-bit address since the segment selector and offset are normally overlapped. Such applications typically use the 16-bit instruction set implemented under the Intel 80286 processor.

**32-bit.** Term used to describe an application which uses the 0:32 addressing scheme implemented under OS/2 Version 2.0+. Such applications may make full use of the 80386 instruction set.



